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RURAL OFF-FARM EMPLOYMENT IN THAILAND

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SUMMARY REPORT AND SYNTHESIS OF THE RURAL OFF-FARM
EMPLOYMENT ASSESSMENT PROJECT

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Chapter 1

Introduction

by

Narongchai Akrasanee

INTRODUCTION

1.01 This publication presents the major findings of the recently completed research project entitled "The Rural Off-Farm Employment Assessment Project (ROFEAP)". The project was initiated with the assistance of the United States Agency for International Development (USAID), to assist the Royal Thai Government (RTG) in identifying interventions which could serve the purpose of increasing the rate of growth of productive non-agricultural employment in rural areas.

A. THE PROJECT

The Problem

1.02 A problem of major concern to Thailand has been in the area of employment and income generation in rural areas. Thailand's real per capita income growth has increased at about 4% annually over the past two decades. This growth has, however, been unevenly distributed across the population. Industrial policy emphasizing large and capital intensive investment has led to a concentration of manufacturing activities in the Central region. Agricultural policy emphasizing mechanization has favored larger farms. These and other policies have yielded a more uneven distribution of income than might otherwise have been possible, and have constrained growth of labor demand. Although the birth rate has fallen in recent years, the large number of births since 1960 will create a substantial increase in the rural labor force in a near future which, because of continuing mechanization, will not be able to find acceptable income and employment opportunities in agriculture. The next 10 to 15 years therefore constitute a critical economic and political period in which significant efforts must be made to establish means of absorbing labor in productive activities outside agriculture.

1.03 The Rural Off-Farm Employment Assessment Project (ROFEAP) was to address these issues of employment outlined above. The essential purpose of ROFEAP, which terminated in September, 1982, was to generate data and analyses that could enable the RTG, USAID and other donor agencies to design, implement and evaluate policies, programs, and projects to promote rural small scale industry. For this purpose the research consisted of three interrelated components; a rural non-farm enterprise component, farm level surveys, and an analysis of rural financial markets. U.S. assistance in the project, implemented through Kasetsart University, was slightly less than \$1 million, drawn from grant funds and DS/RAD centrally funded project funds. The latter were used primarily to support a full-time research advisor and short-term technical assistance from Michigan State University (MSU) and Ohio State University (OSU).

Major Findings

1.04 The basic scope of work of the project consists of achievement of 12 explicit objectives spread across three primary project components: rural non-farm enterprise, farm level surveys, and rural financial markets.

(a) Rural Non-farm Enterprise.

1.05 The Phase I survey comprehensively enumerated the enterprises which exist in the municipal areas of four provinces: Chiang Mai, Khon Kaen, Roi Et and Suphan Buri. The data generated includes the number of establishments in each economic subsector, characteristics of employment, distribution of firm sizes, physical characteristics of establishments, and a general overview of the composition of each subsector. Similarly, the survey enumerated the major non-farm (i.e. non-agricultural) enterprises of 10,600 households in 74 villages. In both cases survey results suggest that data generated by the Ministry of Industry and the National Statistical Office tend to underestimate the number of non-farm enterprises in rural areas, and to misrepresent their nature and composition.

1.06 The Phase II survey drew a sample of 147 firms from the Phase I town enumeration, and added a number of others from the Phase II village survey. In all, the project studied 14 types of enterprises in great detail: ready made garments, silk weaving, cotton weaving, bamboo products, reed mats, metal hand tools, bean curds, noodles, fruit and vegetable pickling, cement products, bricks, pottery, furniture, and wood carving. The study conclusions are that garments and silk weaving offer greatest potential in the areas surveyed.

1.07 For the 14 types of enterprises noted above the study provides highly detailed information on: price and availability of raw material inputs; labor requirements; wages and seasonality of labor supply and demand; production processes and technologies; volumes of sales; values of sales; marketing systems; characteristics of entrepreneurs; cash flow and financial requirements; etc. This data base provides a rich resource of information about the variety of constraints and opportunities facing the enterprise types in question.

1.08 The project assessed the impact of existing and potential Thai industrial policies and programs on rural vs urban and large vs small scale enterprise development. The basic conclusion reached was that the existing Thai industrial policies and programs favor urban over rural, and large over small scale enterprise development. The project also thoroughly reviewed institutions and current programs having direct and indirect bearing on rural enterprise development. It has been found that the institutions and programs are limited in number and effectiveness.

(b) Farm Level Surveys

1.09 The Phase I survey collected extensive general information on the farm and non-farm activities of about 10,600 households in 74 villages. The Phase II survey, based on weekly interviews of 478 households in 25 villages in four provinces, has produced massive amounts of information on farm and non-farm income generation activities of rural households. This data is so extensive that years of dedicated effort will not exhaust the analytical potential of the data base. This component is potentially the most useful product of ROFEAP because it can be used to answer a great number of questions which the RTG, USAID and other donor agencies might choose to ask.

1.10 The data gathered in the Phase II survey provide extensive coverage of the uses of household and hired labor in farming activities, and also the absorptive effect of alternative cropping patterns. Most of these aspects were integrated into seven linear programming models to reflect a typology of farm enterprises found in the 4 provinces surveyed. Experimentation with these models suggest that in all cases household income can be increased through reallocation of available family resources to alternative cropping and to non-farm activities at the same time. However, the study has also found that there are essentially two types of non-farm enterprise. One, which ROFEAP labels as non-farm enterprise, is the income generating activity of household members on the farm (e.g. craft products). The other, called off-farm activities, cover income generation from the sale of labor services to other farms, to manufacturing and service enterprises in the area or further away, etc. The study suggests

that the traditional distinction between farm and non-farm activities is inappropriate, at least for the villages covered. Households appear to design their income-generating patterns around the opportunities and constraints which immediately face them. Depending on the season, the type of farm, the availability of skilled family labor, etc., by and large household labor forces are constantly at work and generating income; and do so in a great variety of ways. The key conclusion that arises from these observations is that in some rural areas the issues of underemployment and labor absorption are in the short-term at least, less important than the challenge of identifying and developing an array of programs and projects which serve the purpose of maximizing the returns to labor in farm, non-farm and off-farm activities simultaneously.

1.11 The study has shown that although there is a degree of relationship between farm size and the importance of non-farm income sources (both on and off the farm) in the villages surveyed, this relationship is not as clear-cut as may originally have been envisaged. Other factors, such as type of farm (i.e. irrigated vs. rainfed), labor productivity in craft enterprises on the farm, returns to labor off the farm, household size, etc. are equally important indicators of the importance of non-farm enterprise expansion.

(c) Rural financial Markets

1.12 The study examined sources and uses of finance by farm households, and carried out an extensive analysis of how various types of households use the funds on a weekly basis. The data and the relationships which have been documented can be very helpful in design of rural credit schemes, and in the determination of whether or not such schemes are warranted. The study also attempted to glean similar information from a special questionnaire administered to town-based enterprises, but failed to generate much useful information.

1.13 Finally, the study has produced one paper which addresses the objective of identifying the incentives and impediments which exist for financial markets to broaden lending and savings services in rural areas. The paper concludes that although local bank branches are interested in and compete heavily in mobilizing rural savings and deposits, they are not yet equipped for effective lending to small borrowers engaged in agricultural or manufacturing activities. Thus the supply of capital resources per se is not an immediate problem. The problem is one of identifying a mechanism to bridge the gap which separates lenders from credit-worthy potential borrowers.

B. ORGANIZATION OF THE PUBLICATION

1.14 The publication has the objective of making the research results of ROFEAP available to a wide professional audience. It is intended to make many more RTG and donor agencies aware of what ROFEAP has produced, and what its staff at Kasetsart University can continue to produce from existing data, or can do to generate new data. More importantly the publication would like to turn the major findings of ROFEAP into program and action oriented discussions.

1.15 To achieve the above the publication is organized into seven chapters. Following the introduction the findings on rural income and employment in Thailand are discussed in Chapter 2 by Dr. Tongroj Onchan and Dr. Yongyuth Chalamwong. Contained in the chapter are the discussions on; the structure of rural income by sources, by income level of households, by seasonal variation; structure of rural employment by family characteristics, by hour available and hour of work, by allocation of labor among economic activities, by type of employment (on and off-farm), and in terms of factors affecting labor supply and various types of employment problems; relationship between agricultural and non-agricultural activities; and future trends and implications. It is shown in this chapter that on and off-farm employment is a major activity and a major source of income of agricultural households in

the project areas. These various types of employment are much more important to the livelihood of the rural households than generally believed. One important aspect is its stabilizing effect on the income flow during the year. The implication of these findings is that the promotion of non and off farm employment would contribute to a higher and more stable income of the rural households.

1.16 The project emphasizes non and off-farm employment in village or cottage industries and town industries. Because of the basic differences between village and town industries, they are dealt with in two separate chapters. Chapter 3, on village industry, is authored by Dr. Pradit Charsombat, while Chapter 4 is on town industry and is authored by Dr. Somsak Tambunlertchai.

1.17 The chapter on village industry discusses; the extent and compositions of village industry; operational characteristics and roles of village industry in income and employment generation for rural households; the relationships of household manufacturing, agriculture and off-farm work; the problems of village industry and the potential for facilitating an expansion of village industry through the changes in marketing arrangements, production patterns, and availability of inputs used for village industry. The main findings of this chapter are that the characteristics of village industry are area specific and industry specific. Thus policy measures to promote village industry have to be designed with a certain degree of specificity. The chapter ends with a list of suggested activities to promote village industry.

1.18 Chapter 4 deals with industries located in provincial towns. The discussions include an overview of town-based industrial activities, their operational characteristics, and their major problems. It is shown that research carried out under ROFEAP reveals many interesting issues concerning town-based industry. The basic finding is that industrial enterprises located in provincial towns have a close link with the rural economy, through the use of local raw materials, sales of the products, employment of the local, and their link to the villages under subcontracting arrangements. On these bases it is argued that the promotion of town based industry is fully justified, and should be carried out taking into consideration the special characteristics identified.

1.19 Having discussed the various activities which generate non and off-farm employment, with emphasis on industrial activities, the roles of the government and the private sector in promoting village and town industries are then discussed in Chapter 5 by Dr. Narongchai Akrasanee based on the materials prepared by Dr. Jacques Amyot. The Chapter first reviews the impact of the government industrialization policy on rural industries, which is rather unfavorable. Then the various promotional measures are discussed, and are shown to be limited in number as well as effectiveness. The major conclusion therefore, is that while village and town industries mean a great deal to the livelihood of the rural households, so far there has been little promotional effort from the public and the private sectors for them.

1.20 To develop an effective program to promote non and off-farm employment, which is the ultimate aim of the ROFEAP, it is considered essential to understand the development of the rural economy of Thailand. This subject is discussed by Dr. Chamlong Atikul in Chapter 6, based on ROFEAP outputs and materials from other sources. Topics included in the chapter are: the rural economy as an integrated system of agricultural and non-agricultural activities; the rural economy as part of a national and world economic system; advantages of distributing benefits of growth; and finally policy implications of these relationships. The chapter in effect puts the ROFEAP findings on rural employment and income into the perspectives of national economic development. It demonstrates that the ROFEAP's major findings are relevant and be generalized to the national level.

1.21 The last chapter puts together policy implications and suggested programs of actions based on the ROFEAP's findings. The programs include both action-oriented studies as well as actions to be implemented individually and together with other programs.

1.22 Information on ROFEAP is provided in the four annexuses. Annex A summarizes the data available from ROFEAP and the means of making use of them. Annex B presents the research models used. Annex C lists all of the publications produced by ROFEAP and provides synopses of the research papers and other major papers. Finally Annex D discusses the services which are provided by the ROFEAP researchers and staff at the Center for Applied Economic Research, Kasetsart University

Chapter 2

Rural Income and Employment in Thailand

by

Tongroj Onchan and Yongyuth Chalamwong

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RURAL INCOME AND EMPLOYMENT IN THAILAND

2.01 Despite a relatively high rate of economic growth over the past two decades, income inequality is still high and rural poverty is still widespread, especially in the Northeast and the North. This problem is well recognized by the Thai government and various measures have been put into effect. Rural development strategy, aiming specifically at eradicating rural poverty in the poorest regions, has received the highest attention. The success of the new strategy depends on a number of factors some of which have been discussed elsewhere.¹ To gain an insight into the rural problems, an analysis of employment, income, and poverty among the rural households is required.

2.02 In this chapter, data from the ROFEAP will be used to analyze rural income and employment in Thailand. Available evidence from other sources will also be used. Some emphasis will be given to the significance of off-farm employment and income which are considered to be of particular interest and relevance for policy formulation and implementation. First, an analysis will be made of the structure of income, its level and patterns of rural households. Then, a discussion on employment will be presented. Finally, future trends and implications will be briefly mentioned.

A. STRUCTURE OF RURAL INCOME

Sources of Income

2.03 Income of rural households comes from various sources which may be conveniently classified into two major ones; farm income and non-farm income. However, to gain a better insight into the general structure of rural household income, as shown in Table 2.1 non-farm income is further divided to include wage income and income from other sources. As it is generally found in developing countries, rural households, especially the poor ones, depend considerably on income from non-farm sources. Non-farm enterprises (those operated and managed by the household) are important in terms of both income and employment. So is off-farm income (all monetary income earned by all household members from wages and salaries received for work in farm and non-farm enterprises owned and/or operated by other households and firms). Considering this fact, the importance of non-farm sources of income to the rural household should be of great interest especially in the analysis of the rural poor. In fact, non-farm employment and income have become increasingly recognized in the formulation of the strategy for rural development which aims at eradicating rural poverty, improving the distribution of income and building up a sound foundation for the rural economy.²

2.04 As can be seen in Table 2.1, Non-farm and wage incomes constitute a significant portion of the total net family income (68.5 percent in Chiang Mai, 52.9 in Roi Et, 35.8 in Khon Kaen and 20.8 in

¹ *Tongroj Onchan and Yongyuth Chalamwong, Structure of Income of Poor Farmers: Significance of Farm Versus Off-Farm Income, Discussion Paper No. 3, of ROFEAP, Center for Applied Economics Research, Kasetsart University, April, 1980.*

² *Richard L. Meyer and Donald W. Larson, "Rural Non-Farm Employment: The Recent East Asian Experience," Journal of Economic Development, July, 1978.*

Table 2.1 : NUMBER OF VILLAGES, NUMBER OF RURAL HOUSEHOLDS, SOURCES, AND AMOUNT OF NET HOUSEHOLD INCOME BY PROVINCE, THAILAND, 1980-81.

(Baht)

Provinces	No. of Villages	No. of Households ^a	Sources of Net Household Income				
			Farm	Non-Farm	Wage	Other	Total
Khon Kaen	8	141	13,275 (47.4)	3,385 (12.1)	6,627 (23.7)	4,713 (16.8)	28,001 (100.0)
Roi Et	5	75	4,889 (22.4)	6,047 (27.7)	5,514 (25.2)	5,404 (24.7)	21,854 (100.0)
Chiang Mai	9	163	6,046 (18.8)	10,629 (33.0)	11,417 (35.5)	4,095 (12.7)	32,187 (100.0)
Suphan Buri	3	42	29,232 (70.8)	-409 (-1.0)	9,027 (21.8)	3,461 (8.4)	41,311 (100.0)
All Provinces	25	421	10,643 (35.5)	6,284 (21.0)	8,544 (28.5)	4,481 (15.0)	29,952 (100.0)

^a One household in Chiang Mai and two households in Suphan Buri were dropped from the study due to questionable data.

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, Research Paper No. 14 of ROFEAP, Center for Applied Economics Research, Kasetsart University, August, 1982.

Suphan Buri). For all provinces, it accounts for 49.5 percent of the total net income. Incomes from farm enterprises are most important in Suphan Buri where land is irrigated.

2.05 Farm income in Suphan Buri accounts for 70.8 percent of the total net income. However, farm income constitutes only 18.8 percent of the total net income in Chiang Mai. In other provinces, e.g., Khon Kaen and Roi Et, farm income accounts for less than 50 percent i.e., 47.4 in Khon Kaen and 22.4 in Roi Et. While the average annual income for all provinces under study is B29,952 per family, Suphan Buri has the highest income of B41,311 compared to B32,187 and B28,001 and B21,854 in Chiang Mai, Khon Kaen and Roi Et, respectively. These results are in line with the average income level in the four regions of Thailand.

2.06 Data in Table 2.1 also indicate the relative importance of non-farm income and off-farm (wages) income in the 4 provinces. For example, in Chiang Mai where farm size is very small (about 1 hectare of land), non-farm income constitutes 33 percent of the total net income whereas off-farm (wages) income is 35.5 percent. In Roi Et, the poorest province in the Northeast non-farm income constitutes the largest portion of the total net income, i.e., 27.7 percent. Wage income is also quite important (25.2 percent of total net income). Agriculture, though considered to be the most important enterprises, contributes only 22.4 percent of the total income. Khon Kaen a relatively better farming area in the Northeast, still has to depend very much on off-farm (wages) income although non-farm income is not very important, constituting only 12.1 percent of the total income.

2.07 It may be of interest to compare the survey data with those for the whole country. In 1978/79, it was reported that income from non-farm sources accounted for 43 percent of the average total income of the farm households in Thailand.¹ This is somewhat lower than that disclosed by the survey data. However, both data clearly indicate the significance of income from non-farm sources which should therefore deserve a great deal of attention by concerned parties.

Income Structure of the Poor and the Rich Household

2.08 An attempt has been made to study the incidence of rural poverty based on the survey data. It is found that 7 out of 25 villages under study were below the poverty line (set at B 3,407 per person per year in 1980/81 price). Out of the seven villages, 4 are in Khon Kaen, 2 in Roi Et and 1 in Chiang Mai. There is no village under poverty in Suphan Buri.²

2.09 As it is commonly argued that the rural poor has to rely greatly on income from non-farm sources, it may be of interest to investigate the sources of income of the rural households in poor and rich villages.

(a) Poor Villages

2.10 As indicated in Table 2.2, in Khon Kaen, Nong Takay village is the poorest with an annual income of B 14,308. In this village, farm income represents 44.2 percent of the total net income. Non-farm income accounts for 24.1 percent while wage and other constitute 15.5 and 16.2 percent, respectively. Other 3 villages in Khon Kaen have farm incomes which range from 16.7 percent in Wong Tua to 41.2 percent in Kok. Non-farm income is very important in Wong Tua (58 percent of total income) while in other two villages, it is quite insignificant especially in Kok where non-farm income accounts for only 0.1 percent. However, in Kok, wage income constitutes about half of the total income while it is only 9.2 percent in Wong Tua and 20.2 percent in Don Kar & Markambia.

2.11 In Roi Et, out of the two poor villages, one depends largely on farm income (i.e. Ka Yai) while another has only 1.3 percent of the total income from farm sources. This village depends greatly on non-farm income (53.8 percent) while Ka Yai had only 2.8 percent from this source. However, Ka Yai receives 35.0 percent of total income from wages compared to 22.5 percent of Nong Bua Tong.

2.12 In Chiang Mai, the only poor village of Hua Rin receives 58.2 percent of total income from farm enterprises. Non-farm income is insignificant (0.6 percent) while wage income is somewhat important (18.7 percent).

2.13 From the above data, it is rather difficult to identify patterns in the sources of income in poor villages. There appears to exist a great variety of the way the poor rural villages earn their income. Some poor villages depend largely on income from farm enterprises while some depend on income from non-farm sources. However, 6 out of 7 villages receive less than half of the total income from farm sources. Non-farm and wage incomes are quite significant in most cases.

¹ World Bank, *Growth and Employment in Thailand*, Report No. 3705a-TH, May, 1983.

² More details see Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, op. cit.

Table 2.2 : SOURCE OF HOUSEHOLD INCOME FOR VILLAGES BELOW THE POVERTY LINE, THAILAND, 1980-81.

(Baht)

Province/Village	No. of Households	Sources of Net Household Income				
		Farm	Non-Farm	Wage	Other	Total
<i>Khon Kaen</i>						
Kok (Nang Ngam)	18	8,001 (41.2)	22 (0.1)	9,652 (49.6)	1,751 (9.1)	19,426 (100.0)
Nong Takay	20	6,329 (44.2)	3,454 (24.1)	2,213 (15.5)	2,312 (16.2)	14,308 (100.0)
Don Kar & Makambia	9	8,140 (39.3)	1,914 (9.2)	4,187 (20.2)	6,469 (31.2)	20,710 (100.0)
Wong Tua	10	2,577 (16.7)	8,932 (58.0)	1,417 (9.2)	2,485 (16.1)	15,411 (100.0)
<i>Roi Et</i>						
Nong Bua Tong	20	159 (1.3)	6,692 (53.8)	2,807 (22.5)	2,792 (22.4)	12,449 (100.0)
Ka Yai	16	7,882 (41.0)	545 (2.8)	6,720 (35.0)	4,066 (21.2)	19,213 (100.0)
<i>Chiang Mai</i>						
Hua Rin	10	9,246 (58.2)	100 (0.6)	2,963 (18.7)	3,574 (22.5)	15,883 (100.0)
<i>Suphan Buri</i>						
None	—	—	—	—	—	—

Source: Yongyuth Chalamwong and Richard L. Meyer, Farm Household Income Levels, Sources and Patterns in Selected Thai Villages, op. cit., Table 4.

(b) Rich Villages

2.14 As shown in Table 2.3, in Khon Kaen, 3 out of 4 villages have a large proportion of income from farm sources ranging from 46.9 percent to 77.2 percent of ranging total income. Only one village has a very small proportion of income (17.7 percent) from farming. In the latter case, wage income largely contributes to the total income. The data for Khon Kaen also indicate that non-farm income is not as significant as wage income.

2.15 However, Roi Et represents a very interesting case. For this province, farm income is not very important except perhaps in one village. Non-farm income is quite significant in two of the three villages. Wage income is also important in this province.

Table 2.3 : SOURCE OF HOUSEHOLD INCOME FOR VILLAGES ABOVE THE POVERTY LINE, THAILAND, 1980-81.

(Baht)

Province/Village	No. of Households	Sources of Household Income				
		Farm	Non-Farm	Wage	Other	Total
<i>Khon Kaen</i>						
Ban Ped	16	6,062 (17.7)	4,486 (13.1)	15,712 (48.8)	8,018 (23.4)	34,284 (100.0)
Kok Samran	27	15,332 (46.9)	5,582 (17.1)	3,191 (9.8)	8,541 (26.2)	32,646 (100.0)
Kok Sung	20	21,572 (52.9)	3,771 (9.3)	12,572 (30.8)	2,869 (7.0)	40,784 (100.0)
Ta Kraserm	21	26,633 (77.2)	173 (0.5)	2,588 (7.5)	5,115 (14.8)	34,509 (100.0)
<i>Roi Et</i>						
Ban Pone	9	4,642 (12.2)	13,400 (35.2)	9,353 (24.6)	10,677 (28.0)	38,062 (100.0)
Pa Perm	10	7,436 (37.2)	2,577 (12.9)	8,949 (44.8)	1,018 (5.1)	19,982 (100.0)
Suan Mon	20	6,055 (22.4)	8,215 (30.4)	3,825 (14.2)	8,904 (33.0)	27,000 (100.0)
<i>Chiang Mai</i>						
Ban Po	22	5,239 (15.5)	510 (1.5)	23,253 (68.8)	4,782 (14.2)	33,784 (100.0)
Roy Prom	20	4,750 (26.5)	1,287 (7.2)	9,336 (52.1)	2,540 (14.2)	17,913 (100.0)
Rong Wua Dang	9	8,588 (26.1)	3,903 (11.9)	12,669 (38.5)	7,710 (23.5)	32,862 (100.0)
San Ma Hoc Fa	40	4,770 (13.7)	18,056 (51.9)	9,963 (28.7)	1,987 (5.7)	34,776 (100.0)
Pa Lan Don Keo	10	14,248 (55.7)	849 (3.3)	8,010 (31.3)	2,480 (9.7)	25,587 (100.0)
Ban Rong	20	4,519 (18.3)	5,096 (20.6)	5,648 (22.8)	9,488 (38.3)	24,751 (100.0)

Table 2.3 : (continued)

Province/Village	No. of Households	Sources of Household Income				
		Farm	Non-Farm	Wage	Other	Total
Kiew Lee Noy	20	3,593 (5.7)	34,530 (54.4)	19,620 (30.9)	5,750 (9.0)	63,493 (100.0)
Muang Kung	12	9,118 (39.4)	11,364 (49.1)	2,911 (12.5)	-235 (-1.0)	23,158 (100.0)
<i>Suphan Buri</i>						
Rai Rot	16	27,629 (69.4)	-741 (-1.9)	8,982 (22.5)	3,978 (10.0)	39,848 (100.0)
Nong Jikrakar	16	39,474 (75.2)	-220 (-0.4)	10,741 (20.5)	2,472 (4.7)	52,487 (100.0)
Nong Jaeng	10	15,411 (59.7)	-186 (-0.7)	6,338 (24.6)	42,388 (16.4)	25,801 (100.0)

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, op. cit., Table 5.

2.16 Chiang Mai also demonstrates an interesting situation. Only one out of eight villages has farm income of over half (i.e. 55.7 percent) of the total income. For other villages, income from farm enterprises ranges from a very low of 5.7 percent to 39.4 percent. Non-farm income is important (about half or over of total income) in three villages. Wage income is very significant for several villages especially for the two villages where over 50 percent of the total income are from this source (i.e. 52.1 and 68.8 percent). Compared to other provinces, non-farm and wage incomes are particularly important. This may be expected since Chiang Mai is well known as a tourist city and the demand for locally made products (e.g. handicrafts and ready-made clothes) is quite large. Moreover, off-farm employment opportunities are rather ample.

2.17 As to be expected, Suphan Buri villages depend largely on farm activities and incomes. Incomes from this source in the three villages are 59.7, 69.4 and 75.2 percent of the total income. Non-farm income is insignificant in this province. In fact, it is negative for all villages. However, wage income is quite important, representing over 20 percent for the three villages. Since Suphan Buri is close to Bangkok and the survey villages are also close to towns, off-farm employment opportunities are usually quite great.

2.18 In summary, there is no clear indication of the pattern of income sources among the rich villages. In some villages, farm income constitutes the largest proportion of family income (i.e. Khon Kaen and Suphan Buri) However, non-farm and wage incomes are very significant in several villages (especially in Chiang Mai and Roi Et). Another finding which is quite interesting is that wage income is quite significant in several villages in the survey provinces.

2.19 For all 25 villages under study, it may be concluded that Thai villages are extremely complex and heterogeneous with respect to the level and patterns of income received by farm households. Out

of the 25 villages, eleven derived the largest share of household income from farm enterprises, six from non-farm enterprises, six from wages, and two from other sources. As for the total net household income, about 35 percent came from farm activities, 21 percent from non-farm activities, 28 percent from wages and 15 percent from other sources. Thus a total of about 65 percent of total income came from sources other than agriculture.

2.20 Finally, based on the data obtained, some relationships between the level and source of income in villages and factors which explain it seem obvious. For example, availability of irrigation water contributes to intensive cropping and an increase in farm income relative to other sources. Villages located close to urban areas offer greater off-farm employment possibilities. Hence this source of income increases in importance. The well-established tourist market in Chiang Mai coupled with several traditional high income non-farm enterprises in the region increases the relative importance of income from non-farm enterprises.

Income Variability During the Year and the Role of Income from Non-farm Sources

2.21 Income of the rural households in Thailand, like that of other developing countries, is generally known to be very seasonal and varied during the year. This is due mainly to the seasonality nature of farm production. Therefore, the cash-flow of the rural households is conceived to be one which has several months of cash deficits and a few months of cash surpluses. This kind of cash flow as generally understood, presents great difficulty for farmers to develop management strategies so that timing of receipts of income will coincide with expenditures. To help release the pressure of cash deficits farmers may resort to borrowing especially during the farm income slacking periods. At the time of harvest, and hence cash surplus period, the farmer can repay the loan. This type of cash flow situation may create a number of serious problems of financial and credit management of the rural households. This in turn can affect farm organization and household income of rural people.

2.22 At this point, it must be clear that farm households obtain a large amount of cash income from sources other than farm. The non-farm and off-farm incomes have helped raise family income of the farmers in all regions of Thailand. This will certainly contribute considerably to the welfare of the rural population. What remains to be investigated is the nature of the income flow of the rural households during the year. This will provide a better understanding of the households ability to meet minimum consumption levels, pay operating expenses, repay debt, accumulate reserves for emergencies, and meet other needs.

2.23 The income data of the Project which cover the twelve-month period for all survey villages incomes are classified into four major types namely farm income, non-farm income, wage income and other. For farm and non-farm, income is also divided into cash and non-cash incomes. However, data to be reported here will be a total of each type only. Data will also be presented to demonstrate how the timing of the multiple sources of income serves to increase or decrease total household income variability, and how a particular source of income may be important in certain periods. With limited space, only data of some villages will be presented in this section.¹

¹*Details of income flows may be found in Yongyuth Chalamwong and Richard L. Meyer, Farm Household Income Levels, Sources and Patterns in Selected Thai Villages, op. cit.*

(a) **Income Variability for Poor Villages**

2.24 Two villages with income levels under poverty line have been selected to represent poor villages in Khon Kaen and Chiang Mai. Tables 2.4 and Figure 2.1 and present the income flow data which will demonstrate income variability in the two poor villages.

2.25 Nong Takay village in Khon Kaen has a rainfed farming as the most important enterprise. Therefore, the largest source of income come from farm activities and the pattern of net farm income flow noted in Table 2.4 and Figure 2.1 Panel A is consistent with the cropping system. The largest amount of farm income is obtained in December after the rice harvest. Net cash farm income was low during the dry season (March – June), and drops slightly during the planting months of June and July due to expenditure on farm operations. Farm income during the dry season is largely non-cash (or imputed value of home consumed farm products, much of which is rice consumed from the previous harvest.) As for non-farm income, the largest amount was received in March. This is also the case of wage at salary income. It can be observed that this latter type of income is quite important during the harvest season.

Table 2.4 : AVERAGE MONTHLY AND YEARLY HOUSEHOLD INCOME, BY SOURCE IN A POOR VILLAGE OF KHON KAEN PROVINCE, (NONG TAKAY), MARCH 1980 – FEBRUARY 1981.

(Baht)

Month	Source of Income				Total Household Income
	Net Farm Income	Net Non-Farm Income	Wage & Salary Income	Other Income	
Mar.	73	707	435	55	1,424
Apr.	310	213	151	114	788
May	479	76	185	73	813
June	421	115	155	165	856
July	261	140	149	298	848
Aug.	528	193	171	113	1,005
Sept.	493	364	101	193	1,151
Oct.	1,002	462	167	218	1,849
Nov.	676	314	122	251	1,363
Dec.	1,395	192	308	302	2,197
Jan.	615	280	216	288	1,399
Feb.	222	398	53	242	915
Total Annual Income	6,329	3,454	2,213	2,312	14,308

Source: *Yongyuth Chalamwong and Richard L. Meyer, Farm Household Income Levels, Sources and Patterns in Selected Thai Villages, op. cit., Table 6.*

Table 2.5 : AVERAGE MONTHLY AND YEARLY HOUSEHOLD INCOMES, BY SOURCE IN A POOR VILLAGE OF CHIANG MAI PROVINCE, (HUA RIN), MARCH 1980 – FEBRUARY 1981.

(Baht)

Month	Source of Income				Total Household Income
	Net Farm Income	Net Non-Farm Income	Wage & Salary Income	Other Income	
Mar.	-464	69	295	479	379
Apr.	376	-353	525	63	611
May	2,870	36	185	503	3,594
June	-273	-1	125	-37	-186
July	190	90	258	322	860
Aug.	-198	5	221	314	342
Sept.	1,405	44	122	239	1,810
Oct.	774	-11	316	569	1,648
Nov.	-519	156	131	558	326
Dec.	2,571	27	262	193	3,053
Jan.	774	30	271	141	1,216
Feb.	1,740	8	252	230	2,230
Total Annual Income	9,246	100	2,963	3,574	15,883

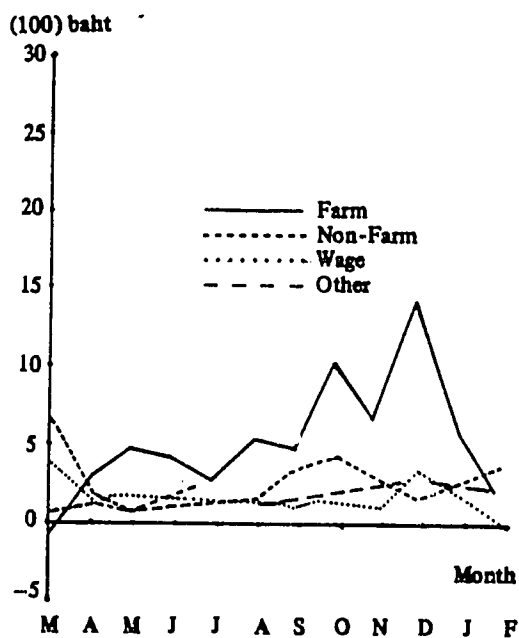
Source: Yongyuth Chalamwong and Richard L. Meyer, Farm Household Income Levels, Sources and Patterns in Selected Thai Villages, op. cit., Table 12.

2.26 In total, the monthly household income varies considerably over the 12 – month period. It ranges from the lowest of ฿813 in May to the highest of ฿2,197 in December. Seven out of twelve months have an income of over ฿1,000 a month. The flow of total net income during the year is clearly dominated by the seasonality in not farm income. However, it is also obvious that non-farm and wage incomes help smooth out the income flow. This should contribute to the improvement in the welfare of the rural household members. The cash flow situation presents cash surpluses all year round.

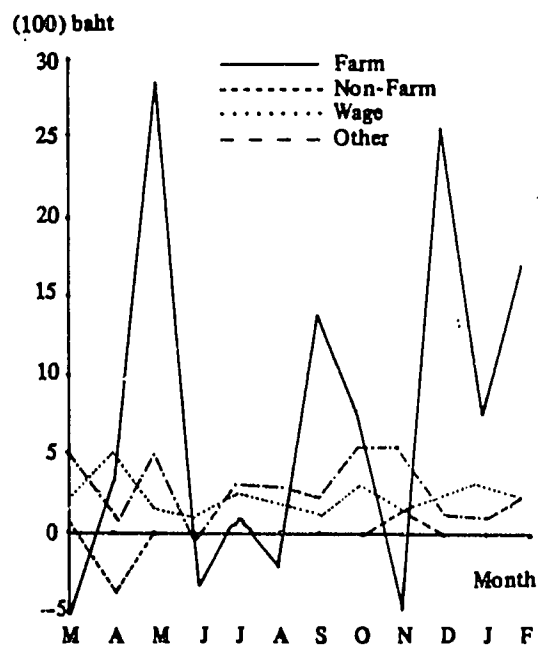
2.27 The case of a poor village of Hua Rin in Chiang Mai is an interesting one. (See Table 2.5 and Figure 2.1 Panel B) The total annual income is a little higher than that of the Khon Kaen's village. Farm activities under irrigated conditions provide the largest amount of income to the household. Rice and soybeans are the two important crops of the village. Cash income shows sharp seasonal patterns and is highest during the month of May due to soybean sales and September, December, and February due to rice sales. Negative farm incomes occur in March, June and November. Non-farm income is not significant in this village. Income from wages and other sources is fairly significant and quite variable. The total household income during the 12-month period varies greatly with a deficit in June. The largest monthly income (฿3,594) is received in May. In three months (March, August and November), income is less than ฿400. This great variability of income must have caused much hardship to people in this poor village.

2.28 In this particular case, non-farm income and wage income do not help in any significant way to lessen the degree of fluctuation of household income. The farm income is quite low due to small farm size and high rate of tenancy.

Figure 2.1 : INCOME FLOW PATTERNS FOR POOR VILLAGES IN KHON KAEN AND CHIANG MAI.



Panel A. Nong Takay (Khon Kaen)



Panel B. Hua Rin (Chiang Mai)

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, op. cit., Figures 1 and 2.

(b) Income Variability in Rich Villages

2.29 Three villages, each from Khon Kaen, Chiang Mai and Suphan Buri, have been selected to represent rich villages in three regions of Thailand (See Tables 2.6, 2.7, 2.8 and Figure 2.2)

2.30 In Khon Kaen, Kok Sung is a rainfed village with glutinous rice, sugarcane, cassava and mat making activities. Sugarcane is the most important cash crop in this village providing the largest amount of farm income which occur in December through February (also with income from sale of rice after harvest.) A relatively high income during the wet season months of August and September was due to the sale of cassava. Deficit months of farm income occur in March, April, July and November. The data on farm income clearly show a great variability due to the seasonality nature of the cropping systems. Net non-farm income is also considerably varied having its peaks in wet season (May and August.) This implies that the type of non-farm activities in this village (mat making) is very complementary to farm activities. Wage and salary income is very significant especially during December through February. This is partly due to a high labor demand for sugarcane harvesting. As for the total monthly household income, it is considerably varied ranging from ฿448 in November to ฿8,541 in January. However, this is considerably less varied than net farm income (See Table 2.6 Figure 2.2, Panel A)

Table 2.6 : AVERAGE MONTHLY AND YEARLY HOUSEHOLD INCOMES, BY SOURCE IN A RICH VILLAGE OF KHON KAEN PROVINCE, (Kok Sung) MARCH 1980 – FEBRUARY 1981.

(Baht)

Month	Source of Income				Total Household Income
	Net Farm Income	Net Non-Farm Income	Wage & Salary Income	Other Income	
Mar.	-838	380	621	587	750
Apr.	-380	496	447	814	1,377
May	559	803	584	135	2,081
June	439	211	560	181	1,391
July	-62	215	696	583	1,433
Aug.	2,038	877	324	171	3,410
Sept.	1,551	297	939	117	2,904
Oct.	795	-5	1,183	477	2,450
Nov.	-927	-34	1,009	400	448
Dec.	9,992	375	2,620	-831	12,156
Jan.	6,198	-5	2,182	166	8,541
Feb.	2,207	161	1,407	69	3,844
Total Annual Income	21,572	3,771	12,572	2,869	40,784

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, op. cit., Table 22.

2.31 In Chiang Mai, Ban Po Village represents a very interesting case. (See Table 2.7 Figure 2.2 Panel B) For farm activities, garlic and soybeans are relatively more important than rice. As a result, the largest amount of net farm income occur in May after the harvesting of garlic and soybeans. After the month of June, net farm income fluctuates greatly with some months of deficits. Non-farm income is not very important and it presents large deficits in some months. Wage and salary income represents the most important source of income for the village. The monthly net wage and salary income is quite stable over the year having its peak in October. The relatively more stable wage and salary income has resulted in a quite stable total household income during the year with only a month (i.e. September) of a very low income. This should not pose a serious problem of financial management within the household.

Table 2.7 : AVERAGE MONTHLY AND YEARLY HOUSEHOLD INCOMES, BY SOURCE IN A RICH VILLAGE OF CHIANG MAI PROVINCE, (BAN PO), MARCH 1980-81

(Baht)

Month	Source of Income				Total Household Income
	Net Farm Income	Net Non-Farm Income	Wage & Salary Income	Other Income	
Mar.	-214	-1,270	2,315	2,369	3,201
Apr.	438	104	1,921	579	3,042
May	1,761	323	1,486	124	3,694
June	1,283	591	1,305	111	3,289
July	167	-79	2,766	-49	2,805
Aug.	-15	783	1,815	188	2,771
Sept.	64	-173	641	223	755
Oct.	495	-41	3,178	209	3,841
Nov.	204	6	1,878	182	2,270
Dec.	964	319	2,378	323	3,984
Jan.	-24	-402	1,504	279	1,357
Feb.	116	349	2,066	244	2,775
Total Annual Income	5,239	510	23,253	4,782	33,784

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, op. cit., Table 22.

2.32 Finally, in Suphan Buri, Nong Jikraka is an irrigated village with rice as the most important farm enterprise. Net farm income varies greatly over the year with 5 months of deficits. The largest amount of farm income is in January after the harvesting of rice. Net non-farm income is insignificant and is negative for the whole year. Wage and salary income is quite significant especially during the deficit months, and together with other income help lessen the fluctuation in income flow of the household. However, it is still greatly varied with deficits in March and September. (See Table 2.8 Figure 2.2 Panel C).

2.33 In summary, income variability appears to pose a serious problem to both poor and rich villages. This problem also appears to be more serious for rich villages as the degree of variability is much greater. In general, net farm income is relatively more variable than total household income. This implies that income from non-farm sources, besides helping raise total income, also help lessen income variability thereby improving the welfare of the rural households. Since income difference between the poor and the rich villages is quite great, the greater variability of income for the rich village should not affect very much the welfare position of the people. In short, income from non-farm sources contribute in a very significant way to the improvement of general welfare of the Thai villages.

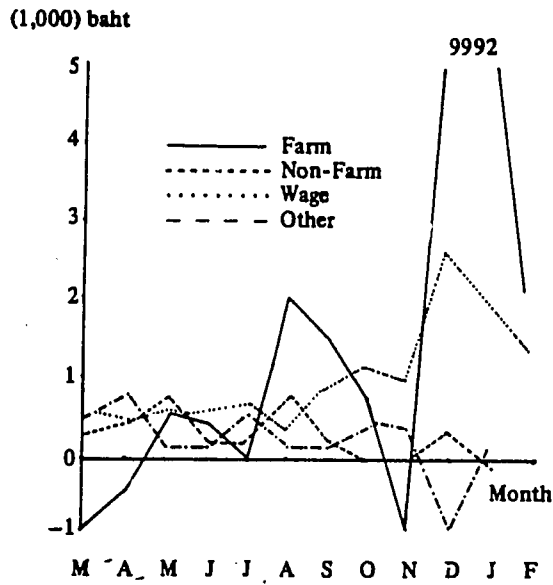
Table 2.8 : AVERAGE MONTHLY AND YEARLY HOUSEHOLD INCOMES, BY SOURCE IN A RICH VILLAGE OF SUPHAN BURI PROVINCE (NONG JIKRAKAR) MARCH 1980 – FEBRUARY 1981

(Baht)

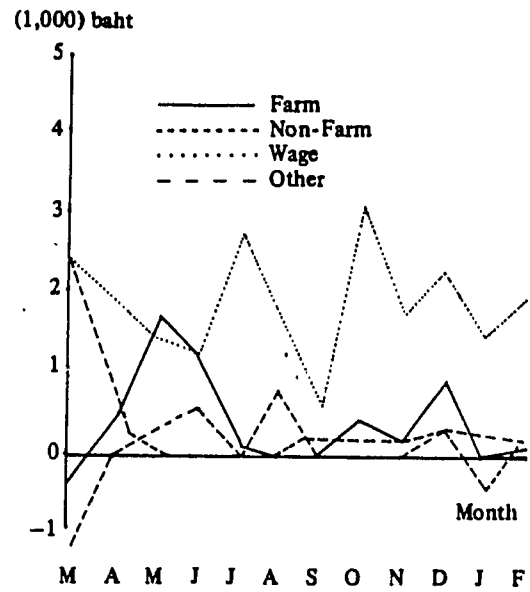
Month	Source of Income				Total Household Income
	Net Farm Income	Net Non-Farm Income	Wage & Salary Income	Other Income	
Mar.	-369	-260	167	81	-380
Apr.	-280	15	99	997	831
May	90	-	924	-183	830
June	296	-	159	383	838
July	732	-	768	266	1,766
Aug.	-502	-	479	294	271
Sept.	-1,507	-	970	106	-431
Oct.	1,094	-	864	519	2,477
Nov.	-32	6	979	72	1,025
Dec.	10,027	6	2,171	50	12,254
Jan.	28,813	12	2,183	-169	30,839
Feb.	1,112	-	986	50	2,148
Total Annual Income	39,474	-221	10,749	2,466	52,468

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Villages*, op. cit., Table 29.

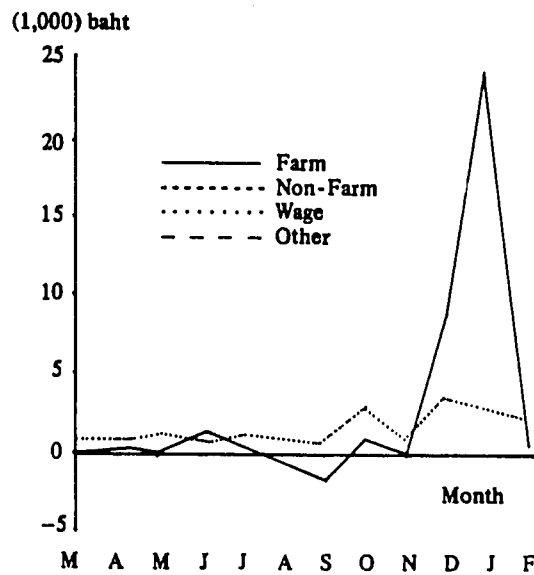
Figure 2.2 : INCOME FLOW PATTERNS FOR RICH VILLAGES IN KHON KAEN, CHIANG MAI AND SUPHAN BURI.



Panel A. Kok Sung (Khon Kaen)



Panel B. Ban Po (Chiang Mai)



Panel C. Nong Jikrakan (Suphan Buri)

Source: Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai villages*, op. cit. Figures 4, 5 and 7.

B. STRUCTURE OF RURAL EMPLOYMENT

Family Characteristics, Potential Labor Force

2.34 The average family size among the households in four provinces varies from 4.6 persons in Chiang Mai to 6.9 in Suphan Buri, with the size in Khon Kaen and Roi Et in between. The overall average of total family members who are resident of the first survey week is 5.9 persons (See Table 2.9).

2.35 The distribution of household members by age and sex is shown in Table 2.10. In total, the distribution of males and females are almost the same. This sex distribution patterns are similar across the provinces. The proportion of persons in the 1 – 10 age group ranges from 14 to 20 percent, while distribution found in the oldest age group is also small. The family members in the working age (11–60) is roughly 80 percent which places a lot of pressure on the labor market to absorb all this labor supply. Next, we classified the labor force into three categories: adult males and females (15–65 years), children (7–14), and old persons (65 and over), then calculate the percentage of employed persons to get the potential labor force. In Thailand, unlike other agrarian societies, males and females seem to be equally important in terms of working in all activities, especially in agricultural work, since females usually assist males in preparing land for planting, seeding, taking care of crops, harvesting and threshing. During off-peak season, females can contribute more frequently in housework activities and other sideline business activities within the household, while males frequently travel to nearby towns and cities to search for off-farm work. From Table 2.11 the results clearly show that percentages of employed persons are not much different between males and females across the regions. In general, the percentage of employed males are fairly high ranging from the lowest 83 percent in Suphan Buri to the highest 96 percent in Khon Kaen.

Hour Available and Hour of Worked

2.36 As stated earlier, the farm-household labor force includes all persons 7 – 65 years of age living in the household regardless of age, health, family relationships or marital status. This labor force is grouped into three categories: adult males and females (15 – 65 years), children (7 – 14 years), and old persons (65 years and over). This section will provide details on how much time is available for working, and how much time is allocated among different activities.

2.37 The actual working time is recorded weekly for all family members, then they are grouped and reported by month. Despite the fact that the data account only for time actually spent on economic activities the hourly available of all provinces except Suphan Buri is almost reached. In general the percentage of hours actually worked to total hour available is about 85. The proportion, of course, varies by provinces where the highest is in Chiang Mai with 94.5 percent and the lowest in Suphan Buri with 58.2 percent. Labor utilization over the year fluctuates month by month. In all areas, the actual hours, some even go beyond the hours available during the planting and harvesting seasons. The proportion drops considerably during the dry season. Similar patterns are found in all provinces (Table 2.12).

Allocation of Labor Among Economic Activities

2.38 Household family members allocate their work time among a variety of farm and non-farm activities. In this study, economic activities are classified into three categories: On farm production of agricultural products, (farm work), on farm production of non-agricultural products (non-farm work), and off-farm production of agricultural and non-agricultural products (off-farm work).

Table 2.9 : NUMBER OF HOUSEHOLD, HOUSEHOLD MEMBER AND AVERAGE MEMBER PER HOUSEHOLD IN AREA STUDIED, FEBRUARY 1980

All Areas Studied	Village	Households	Household Member	Average Member per Household
Khon Kaen	Kok	18	115	6.3
	Nong Takay	20	149	7.4
	Ban Ped	16	110	6.8
	Kok Samran	27	159	5.8
	Don Kar & Makambia	9	59	6.5
	Kok Sung	20	144	7.2
	Wang Tua	10	45	4.5
	Ta Kraserm	21	162	7.7
	Sub-Total	141	943	6.7
Roi Et	Ban Pone	9	73	8.1
	Nong Bua Tong	20	137	6.8
	Pa Perm	10	58	5.8
	Suan Mon	20	135	6.7
	Ka Yai	16	100	6.2
	Sub-Total	75	508	6.7
Chiang Mai	Ban Po	22	116	5.2
	Roy Prom	20	92	4.6
	Rong Wua Dang	10	50	5.0
	San Ma Hoc Fa	40	162	4.1
	Pa Loan Don Kao	10	57	5.7
	Ban Rong	20	104	5.2
	Hua Rin	10	47	4.7
	Kiew Lee Noy	20	81	4.1
	Muang Kung	12	51	4.2
Sub-Total	164	760	4.6	
Suphan Buri	Rai-Rot	16	96	6.0
	Nong Jikrakar	18	138	7.6
	Nong Jaeng	10	71	7.1
	Sub-Total	44	305	6.9
All Areas Studied		424	2,511	5.9

Source: Sumala Sirichot, *A Summary of Research on Employment and Unemployment in Rural Areas, (in Thai), Paper presented at a conference on ROFEAP, Pattaya, Thailand, September, 1981, Table 1.*

Table 2.10 : DISTRIBUTION OF HOUSEHOLD MEMBERS BY AGE AND SEX

Age (Year)	All Areas Studies			Khon Kaen			Roi Et			Chiang Mai			Suphan Buri		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1-10	498 (19.8)	257 (10.2)	241 (9.6)	207 (22.0)	111 (11.8)	96 (10.2)	126 (25.0)	60 (11.9)	66 (13.1)	108 (14.2)	55 (7.2)	53 (7.0)	57 (18.7)	31 (10.2)	26 (8.5)
11-20	729 (29.0)	366 (14.6)	353 (14.1)	279 (29.6)	146 (15.5)	133 (14.1)	153 (30.4)	75 (14.9)	78 (15.5)	192 (25.3)	83 (10.9)	109 (14.3)	95 (31.1)	52 (17.0)	43 (14.1)
21-30	484 (19.2)	265 (10.5)	218 (8.7)	163 (17.3)	92 (9.8)	71 (7.5)	86 (17.1)	51 (10.1)	35 (6.9)	180 (23.7)	89 (11.7)	91 (12.0)	55 (18.0)	34 (11.1)	21 (6.9)
31-40	236 (9.3)	112 (4.5)	124 (4.9)	92 (9.8)	42 (4.5)	50 (5.3)	58 (11.5)	25 (5.0)	33 (6.6)	58 (7.6)	31 (4.1)	27 (3.5)	28 (9.2)	14 (4.6)	14 (4.6)
41-50	253 (10.0)	131 (5.2)	122 (4.8)	87 (9.2)	46 (4.8)	41 (4.3)	43 (8.5)	23 (4.6)	20 (4.0)	87 (11.4)	44 (5.8)	43 (5.7)	36 (11.8)	18 (5.9)	18 (5.9)
51-60	193 (7.6)	95 (3.8)	98 (3.9)	66 (7.0)	29 (2.9)	39 (4.1)	26 (5.2)	25 (5.0)	11 (2.2)	76 (10.0)	42 (5.5)	34 (4.5)	25 (8.2)	11 (3.6)	14 (4.6)
61-70	80 (3.2)	41 (1.6)	39 (1.5)	36 (3.8)	18 (1.9)	18 (1.9)	8 (1.6)	3 (0.6)	5 (1.0)	30 (3.9)	16 (2.1)	14 (1.8)	6 (2.0)	4 (1.3)	2 (0.6)
70+	48 (1.9)	20 (0.8)	28 (1.1)	13 (1.4)	4 (0.4)	9 (0.9)	3 (0.6)	1 (0.2)	2 (0.4)	29 (3.8)	13 (1.7)	16 (2.1)	3 (1.0)	1 (0.3)	2 (0.6)
All Age	2511 (100.0)	1288 (51.3)	1223 (48.7)	943 (100.0)	486 (51.5)	457 (48.5)	503 (100.0)	264 (52.5)	239 (47.5)	760 (100.0)	373 (49.1)	387 (50.9)	305 (100.0)	165 (54.1)	140 (45.9)

Source: Sumala Sirichot, *A Summary of Research on Employment and Unemployment in Rural Areas*, op.cit., Table 2.

Table 2.11 : PERCENTAGE OF EMPLOYED PERSON CLASSIFIED BY VILLAGE

Area Studied	Village	Employed Person (%) Males	Employed Person (%) Females
Khon Kaen	Kok	93.93	84.84
	Nong Takay	92.94	90.90
	Ban Ped	92.59	89.65
	Kok Samran	95.55	92.15
	Don Kar & Makambia	96.87	98.69
	Kok Sung	97.82	97.14
	Wang Tua	100.00	98.11
	Ta Kraserm	97.22	95.06
	Sub-Total	95.65	92.06
Roi Et	Ban Pone	95.23	95.05
	Nong Bua Tong	97.05	87.17
	Pa Perm	97.66	97.66
	Suan Mon	94.28	89.02
	Ka Yai	82.17	87.43
	Sub-Total	92.53	91.66
Chiang Mai	Ban Po	96.96	97.14
	Roy Prom	92.66	86.11
	Rong Wua Dang	89.47	83.33
	San Ma Hoc Fa	95.58	96.96
	Pa Loan Don Kao	95.05	88.23
	Ban Rong	96.16	96.42
	Hua Rin	80.53	92.30
	Kiew Lee Noy	95.73	85.29
	Muang Kung	99.54	93.75
	Sub-Total	94.31	92.22
Suphan Buri	Rai-Rot	93.51	75.89
	Nong Jikrakar	77.45	74.44
	Nong Jaeng	82.05	79.16
	Sub-Total	83.24	77.97

Source: Yasno Banno, *Farm Household Labour Supply in Non- and Off-Farm Work in Rural Thailand*, Unpublished Master Thesis, Thammasat University, 1982, Table 4.5.

Table 2.12 : TOTAL HOUR AVAILABLE, TOTAL HOURS OF WORKED AND PERCENTAGE OF HOUR AVAILABLE CLASSIFIED BY PROVINCE

(Unit : Hours)

Province		Wet Season						Dry Season					All Average	
		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.		May
Khon Kaen	Hours Available	20370	20680	20320	20520	20960	20430	20730	19960	19440	20440	21220	20750	10485
	Hours Worked	18669	23153	20076	12806	17133	21284	21395	17122	16394	18153	16880	18295	18781
	% of Hours Available	91.80	111.96	98.80	81.90	81.74	104.18	103.21	85.78	84.33	88.81	79.55	88.17	91.68
Roi Et	Hours Available	10470	11150	10720	10200	10220	10270	10470	10010	10280	10840	10900	10990	10561
	Hours Worked	8531	11994	8840	6724	7323	10363	8822	6928	7411	10078	7424	7837	9445
	% of Hours Available	81.48	107.57	82.46	65.92	71.65	100.91	84.26	69.21	72.02	92.12	68.11	71.31	89.43
Chiang Mai	Hours Available	19850	20000	19870	20150	19690	19780	20030	19680	19120	20520	20060	20630	19948
	Hours Worked	17926	18502	17546	18195	18180	18492	20439	19147	19007	21437	18168	17513	18853
	% of Hours Available	90.31	92.51	96.41	90.30	92.33	93.49	102.04	92.29	99.41	104.47	90.57	84.89	94.51
Suphan Buri	Hours Available	7020	6870	6460	6390	6964	7090	7030	6850	6610	7130	6730	7050	6850
	Hours Worked	4625	4153	5326	5366	3631	5041	6231	3020	1996	2692	2644	3009	3978
	% of Hours Available	65.88	60.45	82.44	83.93	52.14	71.10	88.63	44.09	30.20	37.75	39.29	42.68	58.21
All Areas	Hours Available	57710	58820	57370	57260	77620	57670	58200	56500	55460	59030	58900	58400	59412
	Hours Worked	49786	57802	53400	47091	46262	55282	56885	46217	44806	52360	45135	46644	50542
	% of Hours Available	86.27	98.27	93.08	82.24	59.60	95.86	97.74	81.80	80.79	88.70	76.63	79.89	85.07

Source: Sumala Sirichot, *A Summary of Research on Employment and Underemployment in Rural Areas, op.cit., Table 4.*

(a) Family Labor Utilization – By Hours Of Work

2.39 Table 2.13 to 2.16 present monthly hours of work of males and females per working member by three categories of work activities. The total hours of work in Khon Kaen, except for the two peak periods, (June – July, and November – December) are fairly stable, especially for males. Farmers seem to adjust themselves very well during the dry season substituting farm activities by both non-and off-farm works. Off-farm and non-farm activities of both males and females are quite stable throughout the year. In fact, during the peak seasons non-and off-farm hours are not much reduced indicating that labor is not fully employed year round.

2.40 On average, about 40 percent of 1,795 hours of males and 44 percent of 1,399 hours of females are allocated to activities other than farm production. The peak hours of males are about 206 and 187 hours in July and December, while during the slack season, the average hours of work drops down to 125 hours in February. Similar patterns of hours works are witnessed for females. The peak months are also observed in July and December however, the average hours of work drops to the level as low as 92 hours in January.

2.41 It should be noted that minor activities¹ are not included in this survey, the average work hours may be underestimated. In rural areas, eventhough many activities seem to be minor and are not income generating but they seem to be the way of life and may add up to many hours of work during the year. Therefore during the slack season or underemployment period, the rate may not be as high as expected (See Table 2.13).

Table 2.13 : MONTHLY HOURS OF WORK PER WORKING MEMBER, KHON KAEN

(Unit: Hours)

	Adult Male				Adult Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
June	93.1	12.4	40.3	145.8	60.1	33.1	16.4	109.6
July	146.9	12.6	46.7	206.2	124.6	24.9	24.3	173.9
Aug.	90.4	16.1	40.3	146.3	72.5	28.1	14.3	114.8
Sept.	77.7	20.3	31.7	128.9	43.6	37.9	12.7	94.1
Oct.	107.1	19.4	40.4	165.1	60.2	43.8	13.7	117.7
Nov.	106.5	7.2	36.4	150.1	86.7	19.0	22.0	127.7
Dec.	124.9	14.4	54.6	187.6	102.9	23.7	27.7	154.3
Jan.	59.0	16.4	53.2	128.7	48.0	25.3	19.8	93.1
Feb.	59.7	16.6	49.0	125.3	44.3	30.0	12.3	91.6
Mar.	59.3	20.7	48.0	128.0	38.2	48.0	16.4	102.6
Apr.	73.8	25.1	49.4	148.3	43.3	51.7	15.1	110.1
May	80.4	15.5	39.6	135.5	60.4	34.4	14.4	109.2
Total	1,078	196.9	519.9	1,795.8	784.9	399.8	214.1	1,398.7
% of Total	60.1	11.0	28.9	100.0	56.1	56.1	15.3	100.0

Source: Yasno Banno, *Farm Household Labor Supply in Non- and Off-Farm Work in Rural Thailand*, op. cit., Table 4.2.

¹Minor activities include taking care of a few animals, repairing fence, buildings, houses and all other household chores.

2.42 In Roi Et, another province in the Northeast, where farming is the primary activity, farm activities do not appear to dominate the total hour worked especially for males. Males seem to participate more in both non-and off-farm works than females. Total yearly hours of work are comparatively lower than in Khon Kaen for both males and females indicating a lower job opportunity in this province. Females have more seasonal fluctuations in farm work than males. This may be the result of females voluntary withdrawal from farms work during dry season to participate more on non-farm activities. Males spent almost double amount of time to off-farm work as compared to females indicating the lack of job opportunity for female in this remote area (See Table 2.14).

Table 2.14 : MONTHLY HOURS OF WORK PER WORKING MEMBER, ROI ET

(Unit: Hours)

	Adult Male				Adult Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
June	93.9	33.9	12.1	139.9	53.5	32.4	7.5	93.4
July	177.1	19.2	19.5	215.7	167.4	14.3	16.0	197.7
Aug.	76.6	34.3	18.8	129.7	75.1	22.8	13.5	111.4
Sept.	50.2	45.9	13.8	109.9	39.2	27.6	7.7	69.5
Oct.	61.2	68.3	16.7	146.2	60.5	36.2	4.9	101.4
Nov.	101.2	43.0	12.4	156.6	120.0	12.7	8.4	141.1
Dec.	101.1	39.8	14.7	155.6	112.6	19.1	4.0	135.7
Jan.	21.8	56.0	18.2	96.0	52.4	27.6	2.0	82.0
Feb.	19.0	68.3	21.1	108.4	51.1	35.0	2.7	88.9
Mar.	17.7	91.7	39.2	148.6	32.9	86.1	6.8	125.7
Apr.	16.5	77.0	32.7	126.2	25.1	77.3	4.9	107.4
May	37.0	55.0	25.3	117.3	33.4	49.0	8.0	90.4
Total	773.4	632.2	244.4	1,650.0	818.1	440.1	86.2	1,344.4
% of Total	46.9	38.3	14.8	100.0	60.8	32.9	6.4	100.0

Source: Yasno Banno, *Farm Household Labor Supply in Non- and Off-Farm Work in Rural Thailand*, op. cit., Table 4.3.

2.43 Unlike, Khon Kaen and Roi Et, off-farm works are major activities in Chiang Mai as it accounts for more than 44 percent for males and 47 percent for females. In general, the seasonal variation in hours of work is also small reflecting better job opportunities in labor market which enable the farmers to adjust their monthly labor hours in response to seasonal farm labor demand. The yearly total work is 1,793 hours for males and 1,652 for females (See Table 2.15).

Table 2.15 : MONTHLY HOURS OF WORK PER WORKING MEMBER, CHIANG MAI

(Unit: Hours)

	Adult Male				Adult Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
June	17.4	33.9	74.6	125.9	20.8	34.9	70.0	125.7
July	73.7	31.7	64.6	169.9	43.1	44.4	71.1	158.6
Aug.	77.4	21.2	45.7	144.2	44.7	33.5	52.1	130.3
Sept.	40.3	34.0	59.1	131.5	24.4	37.1	64.6	126.0
Oct.	37.9	49.2	84.6	171.7	23.2	45.0	88.9	159.1
Nov.	39.4	32.6	59.9	131.9	26.9	34.8	54.2	115.9
Dec.	131.3	13.3	54.9	199.6	96.7	22.2	52.7	171.6
Jan.	40.5	36.1	64.1	140.6	28.8	41.5	56.3	126.5
Feb.	25.3	44.0	70.3	139.6	19.3	45.6	67.9	132.8
Mar.	30.0	48.8	74.7	153.6	15.9	53.3	71.8	138.3
Apr.	39.3	44.0	79.4	162.7	27.3	48.1	72.5	147.9
May	21.2	38.0	62.5	121.7	19.2	36.1	66.2	121.5
Total	573.6	426.9	729.5	1,793.0	390.4	476.3	785.6	1,652.2
% of Total	32.0	23.8	44.2	100.0	23.6	28.8	47.6	100.0

Source: Yasno Banno, *Farm Household Labor Supply in Non- and Off-Farm Work in Rural Thailand*, op. cit., Table 4.4.

2.44 The data on average yearly hours of work in Suphan Buri must be interpreted with caution since the studied areas were under on-going land consolidation project for almost half of the survey year. This is reflected in a lower level of labor reported. The yearly averages of work hours are only 1,018 and 818 hours for males and females, respectively (See Table 2.16).

2.45 In summary, the peaks of long hours of work are found in July, November and December for both males and females. A significant withdrawal of males to work in off-farm activities and of females to work in minor activity or in non-farm work occur during the slack season. Throughout the year, the total number of hours spent per month in off-farm work is less variable than the time spent on non-farm enterprises. The pattern of time allocation observed above has many possible explanations. First, off-farm enterprises usually demand a fairly stable labor supply. Non-farm enterprises in the household are usually more flexible in its labor demand. Therefore, as farm labor demand changes during the year, the time devoted to non-farm enterprises can be adjusted more easily than time spent in off-farm work. Second, males have a comparative advantage in off-farm work because of their ability to travel farther away from home and their ability to earn a higher wage rate, while females have to take a responsibility of child caring, household work, and other minor enterprises.

Table 2.16 : MONTHLY HOURS OF WORK PER WORKING MEMBER, SUPHAN BURI

(Unit: Hours)

	Adult Male				Adult Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
June	47.6	15.5	28.4	91.5	51.4	18.6	15.9	85.9
July	64.7	10.3	26.0	101.1	65.4	10.5	15.0	91.0
Aug.	79.0	5.0	19.7	103.7	68.9	5.2	17.3	91.5
Sept.	80.3	4.3	18.2	102.8	67.4	4.4	16.1	88.0
Oct.	67.4	8.1	20.1	95.6	41.6	10.3	12.4	64.4
Nov.	72.0	5.6	17.8	95.4	59.3	4.6	13.4	77.4
Dec.	107.2	3.0	30.9	141.1	110.6	4.3	18.4	133.4
Jan.	36.0	3.9	19.8	59.6	25.9	4.2	9.9	40.1
Feb.	20.1	2.6	11.3	34.1	16.8	3.2	10.7	30.7
Mar.	22.6	3.4	28.6	59.6	14.3	10.3	9.5	34.2
Apr.	27.8	12.4	30.2	70.4	16.0	17.8	5.6	39.4
May	20.7	16.8	25.9	63.4	16.4	15.1	11.3	42.9
Total	645.6	95.8	277.0	1,018.4	554.2	108.6	156.0	818.7
% of Total	63.4	9.4	27.2	100.0	67.7	13.3	19.0	100.0

Source: Sumala Sirichot, *A Summary of Research on Employment and Unemployment in Rural Areas*, op. cit., Table 6.

(b) Family Labor Utilization-by Farm Size

2.46 This section examines how family members allocate their time month by month classified by farm size, activities and by provinces. From Table 2.17 it can be seen that the total number of hours worked by provinces fluctuates and tends to decrease with farm size. The distribution of work time among activities also varied. However, it is not surprising to observe that the landless farmers place more emphasis on off-farm and non-farm work. Table 2.18 demonstrates that seasonality of labor demand exists for all farm size groups, especially during the peak periods of farming. This may be because part of the labor is withdrawn from other activities, especially from non-farm activities. In general, the distribution of hours of work among activities for small and medium class farmers seems to be equally important, except for some peak months, and in Suphan Buri.

Table 2.17 : AVERAGE MONTHLY HOURS OF WORK PER WORKING MEMBER BY FARM SIZE CLASS

(Unit : Hours)

Farm Size	Farm	Non-Farm	Off-Farm	Total
<i>Landless Farmers</i>				
Khon Kaen	254.5	652.3	717.2	1,624.0
Roi Et	83.1	1,253.9	243.7	1,580.7
Chiang Mai	102.8	720.0	953.2	1,776.1
Suphan Buri	—	—	—	—
<i>Small Farmers</i>				
Khon Kaen	741.5	316.9	534.8	1,593.2
Roi Et	677.6	888.3	205.7	1,771.8
Chiang Mai	525.9	458.3	760.0	1,744.4
Suphan Buri	433.3	12.8	592.0	1,038.1
<i>Medium Farmers</i>				
Khon Kaen	272.9	300.6	322.4	895.9
Roi Et	914.7	383.8	178.0	1,476.5
Chiang Mai	558.9	603.7	663.9	1,826.5
Suphan Buri	647.5	114.0	346.3	1,107.8
<i>Large Farmers</i>				
Khon Kaen	1,167.9	253.4	247.1	1,668.4
Roi Et	771.6	289.6	115.8	1,177.0
Chiang Mai	520.4	503.4	376.0	1,399.8
Suphan Buri	736.9	119.8	213.2	1,069.9

Source: Yongyuth Chalamwong, *Rural Household Labor Supply for Off-Farm Work in Thailand*, Research Paper No. 16 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1982, Tables 18 to 21.

Table 2.18 : MONTHLY HOURS OF WORK PER WORKING MEMBER BY FARM SIZE CLASSES

(Unit : Hours)

	Adult Male				Adult Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
<i>Landless</i>								
June	7.64	54.77	63.69	126.1	7.58	59.12	60.20	127.0
July	18.83	73.22	65.19	176.3	11.03	68.59	88.88	162.5
Aug.	15.86	52.93	70.59	139.4	8.63	52.33	76.23	137.2
Sept.	9.95	71.06	55.87	136.9	5.05	56.81	62.75	124.6
Oct.	6.80	84.83	72.17	163.8	9.32	61.16	91.62	162.1
Nov.	10.67	67.61	58.91	137.2	11.63	47.11	80.19	138.9
Dec.	22.10	63.35	11.73	202.8	20.99	50.08	114.34	185.4
Jan.	6.65	74.65	63.82	145.12	13.76	58.26	68.57	140.6
Feb.	2.80	67.67	61.04	131.52	9.75	63.49	63.49	130.2
Mar.	7.76	91.64	59.97	159.7	7.86	86.28	69.27	163.4
Apr.	11.61	69.64	64.74	146.0	8.53	76.93	70.74	156.2
May	8.52	63.76	50.60	122.9	8.43	61.17	63.29	132.9
<i>Small Farm</i>								
June	41.74	35.09	57.85	134.7	33.12	35.37	48.71	117.2
July	96.84	27.66	58.77	183.3	77.74	40.63	55.04	173.4
Aug.	68.60	27.57	45.51	141.7	57.11	29.91	39.08	126.1
Sept.	48.91	37.01	48.73	134.6	32.74	36.92	40.54	110.2
Oct.	52.81	54.68	63.92	171.4	43.46	47.06	48.87	139.4
Nov.	55.33	35.39	58.48	144.2	57.36	29.55	25.99	112.9
Dec.	113.06	36.99	44.61	185.4	99.41	30.22	42.05	171.7
Jan.	41.80	44.51	57.57	143.9	45.51	37.76	42.63	125.9
Feb.	34.31	50.77	57.12	142.2	39.56	41.47	46.88	127.9
Mar.	30.53	56.68	62.37	151.6	25.62	58.95	43.16	127.7
Apr.	39.60	47.63	70.48	157.7	31.93	55.29	43.18	130.4
May	32.54	40.76	54.09	127.4	29.0	41.33	41.08	111.4
<i>Medium Farm</i>								
June	81.06	18.81	33.63	133.5	57.31	38.97	27.52	123.8
July	139.44	15.03	32.93	187.4	115.79	31.84	30.37	178.0
Aug.	88.14	16.57	26.48	131.2	71.31	33.55	22.94	127.8
Sept.	68.41	23.42	25.56	117.4	41.21	41.26	27.53	110.0
Oct.	90.94	27.56	33.09	151.6	53.40	47.75	33.25	134.4

Table 2.18 : (continued)

(Unit : Hours)

	Adult Male				Adult Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
Nov.	97.91	13.79	29.60	141.3	79.83	27.93	25.74	133.5
Dec.	123.23	11.63	37.44	172.3	118.49	22.03	22.18	162.7
Jan.	46.21	21.14	42.54	109.9	42.66	32.58	25.16	100.4
Feb.	42.69	25.19	42.12	110.0	38.65	38.21	28.82	105.7
Mar.	48.43	32.98	49.98	131.4	35.17	62.37	23.65	121.2
Apr.	56.69	36.92	49.59	143.2	39.03	63.24	27.53	129.8
May	59.67	26.05	39.58	125.3	49.01	40.37	26.02	115.4
<i>Large Farm</i>								
June	34.26	4.27	16.87	55.4	25.07	11.46	8.70	45.3
July	144.41	9.67	23.92	178.0	144.61	16.46	11.31	172.4
Aug.	105.89	9.16	18.25	133.3	89.28	17.33	9.79	116.4
Sept.	85.62	11.97	16.11	113.7	63.84	22.54	10.51	96.9
Oct.	90.62	18.79	18.39	127.8	60.84	32.74	11.62	105.2
Nov.	107.31	9.10	13.79	130.2	100.96	13.51	9.33	123.8
Dec.	140.76	8.49	18.13	167.4	134.43	14.08	10.19	158.7
Jan.	50.38	12.55	22.48	85.4	45.13	18.75	10.38	74.7
Feb.	35.53	18.09	22.19	75.8	34.74	22.93	10.13	67.8
Mar.	39.63	23.04	34.33	97.0	30.85	41.24	17.21	89.3
Apr.	55.32	28.32	27.56	111.2	37.93	45.01	13.76	96.7
May	56.75	18.12	23.43	98.3	48.49	25.86	14.95	89.3

Source: Yongyuth Chalamwong, *Rural Household Labor Supply For Off-Farm Work in Thailand*, op.cit., Tables 12-15.

2.47 As farm size increases, time spent on non-farm work is roughly the same, but off-farm work sharply declines. This evidence is also true for most provinces. For males, as farm size increases, more hours are spent on farm work, while time spent on non-farm is approximately the same, but off-farm sharply declines. For females, farm work is generally unchanged, non-farm work slightly declines, while off-farm work sharply declines.

(c) Family Labor Utilization-by Villages

2.48 In Table 2.19, the work time of each village was classified by activities and sex. The total hours of work spent by each village depend largely on the existence of farm and non-farm enterprises, and the ability of farmers to earn income elsewhere.

Table 2.19 : AVERAGE HOURS OF WORK PER WORKING FAMILY MEMBER BY VILLAGE

(Unit : Hours)

Village	Male				Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
<i>Khon Kaen</i>								
Kok	864.8	45.6	952.8	1,863.2	975.2	52.0	367.2	1,394.4
Nong Takai	1,098.4	380.8	191.2	1,670.4	720.0	595.2	33.6	1,348.8
Ban Ped	924.6	90.4	1,177.6	2,192.8	728.0	498.4	552.8	1,779.2
Kok Samran	1,533.6	195.2	149.6	1,878.4	1,093.6	532.8	92.0	1,718.4
Don Kar	2,098.4	89.6	545.6	2,733.6	667.2	380.0	1,482.4	2,529.6
Kok Sung	937.6	239.2	889.6	2,066.4	925.6	477.6	232.8	1,636.0
Wang Tua	561.6	533.6	202.4	1,297.6	280.8	808.0	204.0	1,292.8
Ta Kraserm	1,220.0	139.2	162.4	1,521.6	898.4	304.8	81.6	1,284.8
<i>Roi Et</i>								
Ban Pone	126.4	659.2	270.4	1,356.6	182.4	1,107.2	77.6	1,367.2
Nong Bua Tong	352.0	1,589.2	296.0	2,187.2	760.0	440.8	208.0	1,408.8
Pa Perm	992.8	464.8	454.4	1,912.0	1,022.4	471.2	71.2	1,564.8
Suan Mon	786.4	432.0	128.0	1,346.4	688.0	166.4	75.2	929.6
Ka Yai	1,104.0	107.2	164.0	1,375.2	1,216.8	248.8	36.0	1,501.6

Table 2.19 : (continued)

(Unit : Hours)

Village	Male				Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
<i>Chiang Mai</i>								
Ban Po	343.2	229.6	1,346.4	1,919.2	284.8	396.0	1,108.0	1,788.8
Roy Prom	690.4	360.0	712.0	1,762.4	317.6	328.0	1,608.0	2,253.6
Rong Wua Dang	764.8	132.0	488.0	1,384.8	294.4	809.6	661.6	1,765.6
San Ma Hoc Fa	434.4	780.8	821.6	2,036.8	232.0	2,762.4	728.0	1,866.4
Don Kao	1,112.0	137.6	700.8	1,950.4	1,156.8	271.2	74.4	1,502.4
Kong	338.4	892.0	436.0	1,666.4	557.6	500.0	626.4	1,684.0
Hua Rin	478.4	141.6	670.4	1,290.4	372.8	737.6	173.6	1,284.0
Kiew Lee Noy	420.0	312.8	1,020.8	1,753.6	276.8	271.2	1,060.6	1,608.8
Muang Kung	259.2	984.8	282.4	1,526.4	292.0	1,184.0	142.4	1,618.4
<i>Suphan Buri</i>								
Rai Rot	571.2	119.2	485.6	1,176.0	509.6	140.0	160.0	809.6
Nong Jik Rakar	631.2	131.2	216.8	979.2	613.6	103.2	100.8	817.6
Nong Jaeng	1,190.4	37.6	267.2	1,492.2	977.6	115.2	352.0	1,444.8

Source: Yongyuth Chalamwong, *Rural Household Labor Supply For Off-Farm Work in Thailand*, op.cit., Tables 4-7.

2.49 In Khon Kaen and Roi Et provinces, the total number of hours worked by males and females is lowest in Wang Tua village and is highest in Don Kar village. The main reason for this lowest hours of work in Wang Tua is that almost 85 percent of rice land were flooded during the past wet season. The major activity remaining in this village was pottery-making. For Don Kar village, farming is the major activity. Farmers spent most of their time growing rice in this area. But, time spent by females for this activity is surprisingly low even though this village is well-known for silk-weaving. In fact they spend a large amount of their time producing silk by means of subcontracting. This contributes to a fairly large time for off-farm work.

2.50 In summary, it appears that agricultural activities are important enterprises in this province. But it is also clear that off-farm enterprise is important. Non-farm enterprises also absorb a large amount of labor.

2.51 As for Roi Et, poorer quality of soils contributes to a very limited farm activity. The total hours of work are roughly the same in two of the five villages. This pattern is clearer for males than females. Nong Bua Tong, one of the poorest village in the region, had the largest amount of hours of work. It is not surprising to observe that a large number of hours of work in non-farm activities is found only for males but not for females because of a unique non-farm activity in the form of blacksmithing which requires male labor. Pa Perm, one of the richest village in the area, is located very close to Roi Et provincial capital where off-farm work opportunity is ample. Males spent as much of their time on off-farm work as in non-farm activities. Basket-making is a major non-farm enterprise which absorbs a large proportion of time from males and females in this village.

2.52 In short, farmers in this province have no consistent pattern of participated activities. A different type of enterprises existing in the area helps farmers to stabilize their time allocation throughout the year.

2.53 Eight of the nine sample villages in Chiang Mai province have a relatively high level of employment. Only one village, namely Hua Rin which is also one of the poorest village, has the lowest level of employment for both males and females. Since the village has access to irrigation water both males and females spend much time growing rice and soybeans. Males spend large amount of their time on off-farm work, while females spend their time on non-farm work such as bamboo-and mat-making as their supplementary activities.

2.54 To summarize, off-farm and non-farm work opportunities are so great in Chiang Mai province that it obscures the importance of other activities. The farmers cannot fully take advantage of the access to irrigation water due to a very limited farm size which in turn contributes to a very limited time devoted for farm work.

2.55 The results of time allocation in Suphan Buri are not particularly interesting because of the on-going land consolidation within the area during the survey year. However, the general conclusion is that farmers seem to be engaged mainly in farming and therefore the level of hours of work is closely related to this activity.

Non and Off-Farm Employment And The Rural Poor

2.56 It is generally found that the rural poor depend greatly on non-and off-farm employment and income for their livelihood. To gain further insight into this issue, some data on the average work hour classified by income classes are presented in Table 2.20. It appears that low-income people work harder than the richer ones. This is indicated by the total number of the hours worked during the year, i.e. 1,812 (for male) and 1,754 hours (for female) in low-income villages as compared with 1,548 (for male) and 1,560 (for female) in the high income villages. In this Table, non-farm and off-farm are

Table 2.20 : AVERAGE WORK HOUR OF ACTIVE RURAL LABOR FORCE CLASSIFIED BY INCOME CLASSES, 1980-81

(Unit : Hours)

Village	Average Number of Hours Worked During the Year							
	Farm		Non-Farm		Off-Farm		Total	
	Number	%	Number	%	Number	%	Number	%
<i>Low income</i>								
Male	650.13	34.8	753.30	41.6	428.34	23.6	1,811.77	100.0
Female	565.05	32.2	345.42	19.7	844.47	48.1	1,754.94	100.0
<i>Medium income</i>								
Male	941.24	56.6	271.95	16.4	443.39	27.0	1,661.58	100.0
Female	729.55	49.5	399.96	27.1	344.82	23.4	1,474.33	100.0
<i>High income</i>								
Male	769.93	49.7	235.38	15.2	542.66	35.1	1,547.97	100.0
Female	640.14	41.0	584.96	37.5	334.73	21.5	1,559.83	100.0

Source: Tongroj Onchan and Yongyuth Chalamwong, Rural Off-Farm Employment and Income of Rural Households in Thailand: Some Research Findings, Research Paper No. 4 of ROFEAP, Center for Applied Economics Research, Kasetsart University, October, 1981, Table 12.

separated to gain a greater detail on the employment pattern. In general, the poor-income households spent more time on both non-farm and off-farm work. Males appear to work more on farm than off-farm (42 percent as compared with 24 percent of total hours worked). However, female members of the households spent about 48 percent of total hour worked on off-farm activities. This is quite remarkable. It may be because of the fact that female adults can find temporary jobs in town and/or in Bangkok (e.g. working as maids and workers at textile factories). As for medium and high-income villages, female adults worked on non-farm more than off-farm. Finally, it may be seen that employment in non-farm and off-farm work is also slightly greater than in non-farm activities among the high-income villages. The medium-income villages appear to depend a bit more on farm work though non-farm and off-farm employment are also very significant.

2.57 Finally, the relationship between farm size and off-farm employment is demonstrated in Table 2.21. As expected, the landless and the small households depend greatly on non-farm and off-farm work. For example, the landless households spend 93 percent of their time on the work compared to 64 percent, 43 percent, and 31 percent of small, medium and large households, respectively. It should also be noted that small and landless farmers particularly depend on off-farm work. Hence, they will be more affected by wage rates (and minimum wage policy) than the larger farmers. As will be shown later, wage rates also considerably affect the labor supply for off-farm work among the rural household members.

Table 2.21 : FARM, NON-FARM AND OFF-FARM EMPLOYMENT OF RURAL HOUSEHOLDS CLASSIFIED BY FARM SIZE, (IN PERCENTAGE) 1980-81

Farm Size	Type of Enterprise			Total
	Farm	Non-Farm	Off-Farm	
Landless household	7.22	46.73	46.05	100.0
Small farmers	36.2	26.7	37.1	100.0
Medium farmers	57.01	16.25	26.74	100.0
Large farmers	68.91	12.49	18.60	100.0
All	43.91	23.81	32.28	100.0

Source : Tongroj Onchan and Yongyuth Chalamwong, Rural Off-Farm Employment and Income of Rural Households in Thailand: Some Research Findings, op.cit., Table 13.

Factors Affecting Labor Supply

2.58 Labor supply models have been constructed to quantitatively test the factors affecting the time allocation of adult males and females, and also for husband and wife.¹ The analysis shows that rural households behave rationally with respect to time allocation. These models for off-farm and non-farm labor supply show that males and females allocate more time to such enterprise activities when their own wages rise. Likewise, they spend less time off-farm, when farm wages and farm size increases. Thus it is clear that off-farm work compete for limited resource. Also as they live farther away from urban centers, they spend less time in off-farm work.

2.59 However, the time spent on non-farm enterprises is difficult to explain from this analysis. Farm earnings are positively related to time spent working on the enterprises. This means that when households earn more farm income through increased in farm size or irrigation more time would be spent on farm work and less off-farm. There is also proportionately more time available in periods of slack farm work which can be spent on non-farm enterprises. Furthermore even in the period of peak season, for farm labor demand, some time can be spent on non-farm activities when farm work is interrupted due to bad weather or other reasons. Thus farm and non-farm enterprises are much more complimentary than are farm and off-farm work.

Unemployment, Underemployment and Seasonal Unemployment

(a) Unemployment

2.60 The general conclusion which emerges from the previous sections is that of a dynamic pattern of time allocation among enterprises year round with a very high rate of labor force participation and large number of hours worked throughout the survey year.

¹The results are summarized from Yongyuth Chalamwong, *Rural Household Labor Supply for Off-Farm Work in Thailand*, op.cit., and Yasno Banno, *Farm Household Labor Supply in Non-and Off-Farm Work in Rural Thailand*, op.cit.

2.61 The farm household labor as defined earlier, includes all persons aged 7 years and above who participate in all economic activities. The definition of economic activities for which hours of work are reported weekly is limited to only major categories of work. This definition excludes hours of work of child care, small enterprises like a few chickens or ducks, and general maintenance of buildings, fences and canals. Unemployment is defined to include those persons of 7 years of age and over who did not participate in any economic activities during the survey week and continued to be so for a month, but still wanted to work. On this basis of the survey undertaken in the four provinces, the average monthly unemployment rates was about 6.9 percent for adult males and 9.2 percent for adult females when all areas were combined. (See Table 2.22) The lowest average yearly unemployment rate of about 4.2 percent for adult males and 7.0 percent for adult females is found in Khon Kaen, while Suphan Buri has the highest with 16.5 percent for adult males and 21.6 percent for adult females. The unemployment rates in Roi Et and Chiang Mai are in between those two provinces. The average yearly unemployment rates are 7.1 percent for adult males and 8.7 percent for adult females in Roi Et and 6.1 percent for adult males and 7.8 percent for adult females in Chiang Mai. In short, the high unemployment rates for males are normally lower than for women. The rates for both males and females are lowest in the North and Northeast provinces, and highest in Suphan Buri.

2.62 It is argued that the definition of employment in this study may underestimate the total time spent on production activities and excludes household production which utilizes a large amount of time for women and children. The household member is considered to be employed if he-she reported at least one hour of work per week within that month. Although the rates may be underestimated, these rates are still higher than those reported in other sources.¹ Therefore, effort was made to estimate unemployment rate by eliminating all unemployed persons who were sick, on holiday, going to school, etc. The average monthly adjusted unemployment rate (U*) has 3.8 percent for males and 6.3 percent for females. These rates are reduced considerably when each province is observed. The adjusted rates has 1.9 percent for males and 3.5 percent for females in Khon Kaen province. These adjusted rates (U*) vary from 2.2 percent in Roi Et. 3.0 percent in Chiang Mai and 13.1 percent in Suphan Buri. For females, the rates are 4.5 percent, 5.6 percent and 20.3 percent for Roi Et, Chiang Mai and Suphan Buri, respectively. The difference between unadjusted rate (U) and adjusted rate (U*) were normally large in the North and Northeast provinces and small in Suphan Buri. Since, the major component of the adjustment element is illness, therefore, this difference somehow, reflects, the health conditions of sample individuals in those two regions.

(b) Underemployment

2.63 In this section, effort will be made to show differences in the underemployment rate, taking into account time differences. Table 2.23 presents the distribution of the average number of hours of worked per week during the month. Twenty hours of work is chosen as arbitrary norm for underemployment. The variation in hours worked per week follows seasonal patterns and confirms the existence of underemployment in the rural areas. On the basis of survey data, the percentage of males reporting of work less than 20 hours ranges from a low of 11 percent in December to a high of 44 percent in November. For females, the percentage reporting ranges from 14 percent in March to 30 percent in October. The rates are quite different among various provinces. Generally, it seems clear that female underemployment rate is higher than that of males for all provinces, the rates are relatively high in Suphan Buri as compared to other provinces. These rates vary throughout the year, but has tendency to be lower during the peak cropping seasons.

2.64 The high proportion of adults reporting less than 20 hours of work could imply considerable underemployment. However, caution must be taken in making use of these results. First, defining

¹ National Statistical Office, *Report of The Labor Force Survey, Bangkok, 1977.*

Table 2.22: UNEMPLOYMENT BY PROVINCE

(Percentages)

Month	Khon Kaen				Roi Et				Chiang Mai				Suphan Buri				All Areas			
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female	
	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
June	5.3	0.8	9.7	5.0	6.0	2.3	10.1	5.0	8.7	5.3	10.0	6.3	9.6	6.4	7.3	6.1	7.2	3.4	9.6	5.6
July	3.1	—	5.0	1.9	2.1	—	3.9	1.6	5.6	2.6	8.1	5.6	3.7	4.3	10.1	6.3	4.7	1.4	6.5	3.6
Aug.	2.3	—	7.4	4.3	8.2	3.0	4.8	3.2	4.9	2.3	8.5	6.3	7.0	3.5	5.3	5.3	5.0	1.8	7.1	4.9
Sept.	2.0	1.5	6.6	2.7	7.8	—	9.3	2.5	7.7	4.1	11.7	9.2	4.8	—	10.4	10.4	5.2	2.0	9.4	5.9
Oct.	7.3	5.3	7.4	4.3	6.2	0.8	8.5	2.5	5.7	2.3	9.0	7.2	5.8	3.5	12.3	9.9	6.3	3.2	8.7	5.7
Nov.	3.6	2.0	3.2	0.8	2.3	—	3.4	0.8	3.8	0.8	6.7	6.0	8.6	6.5	8.2	8.2	4.0	1.7	5.1	3.6
Dec.	2.7	1.2	2.7	—	4.5	1.2	3.3	—	6.3	2.6	5.2	3.0	7.4	3.2	4.8	4.8	5.8	2.0	3.9	—
Jan.	3.7	1.2	8.7	2.8	10.4	5.6	6.0	3.4	5.3	2.3	6.8	5.3	18.0	17.9	18.1	18.1	7.2	4.4	8.7	5.6
Feb.	3.6	1.3	8.0	3.6	13.8	10.8	6.8	6.0	6.3	3.2	6.9	6.5	47.1	42.5	55.3	50.0	11.7	8.8	12.4	10.0
Mar.	3.9	2.0	8.6	3.9	5.6	2.1	10.7	7.4	3.3	1.5	4.3	3.2	36.5	22.4	53.0	49.3	6.9	4.5	12.3	9.3
Apr.	6.4	5.3	8.3	4.9	13.7	0.7	24.2	8.1	4.8	4.4	4.5	1.9	30.0	25.6	46.3	46.3	9.9	6.5	13.8	8.9
May	5.8	4.3	9.6	7.3	5.8	2.9	14.3	13.4	6.9	3.8	10.5	7.3	22.9	17.7	29.6	29.6	8.4	5.6	12.9	10.7
All Months	4.2	2.0	7.0	3.5	7.1	2.2	8.8	4.5	6.1	3.0	7.8	5.6	16.5	13.2	21.6	20.2	6.9	3.8	9.2	6.3

U = Open Unemployment Rates

*U** = Adjusted Unemployment Rates (eliminating all unemployed persons who were sick, on holiday, going to school etc.)

Source: Sumala Sirichoti, *A Summary of Research on Employment and Unemployment in Rural Areas*, op.cit., Table 4-A to 4-E.

Table 2.23 : DISTRIBUTIONS OF HOURS WORKED PER WEEK DURING THE MONTH WITH 1 – 19 HOURS OF WORK

(Unit : Percent of Time Available)

Month	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri		All Areas	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
June	15.2	22.0	9.8	36.9	17.0	17.1	37.2	39.0	17.9	24.9
July	9.3	20.0	11.9	15.7	11.6	12.9	44.7	46.8	14.9	19.5
Aug.	10.8	21.4	15.7	33.6	9.5	12.5	20.9	32.8	12.4	21.3
Sept.	17.4	32.0	24.2	49.9	13.0	10.2	21.6	18.8	17.5	25.3
Oct.	17.1	33.3	21.7	45.7	12.9	12.8	52.3	60.4	20.5	30.8
Nov.	11.5	17.4	10.5	13.4	11.3	12.3	34.4	43.6	44.1	17.9
Dec.	12.4	23.1	17.4	38.0	7.5	14.0	18.1	16.9	41.3	21.4
Jan.	15.6	32.1	28.8	41.9	11.4	10.9	46.0	56.8	20.2	28.7
Feb.	18.5	34.0	17.7	41.0	9.5	13.7	32.1	26.3	16.8	26.7
Mar.	20.1	5.5	23.9	22.1	8.5	13.3	40.8	28.9	19.4	13.9
Apr.	24.1	39.3	29.5	29.0	15.1	17.2	37.7	34.1	23.5	29.0
May	14.8	21.8	19.7	32.7	20.3	20.7	38.5	43.2	20.6	25.5

Source: Sumala Sirichoti, *A summary of Research on Employment and Unemployment in Rural Areas, op.cit., Tables 4--A to 4--E.*

adults as persons age 15 – 65 includes some who may be too young and others too old to work over the year. Second, adults may choose to work very hard during the peak farm periods, and then compensate it by working less during other periods. The arbitrary norms of working standard may be needed to obtain hypothetical levels of full employment to compare with actual hours worked.

(c) Seasonal Unemployment

2.65 Seasonal character of agricultural activities is commonly found in all provinces, especially among those households where crops are their major farm enterprises. Peaks of demand for labor occurred during planting and harvesting seasons followed by a very little or no demand for agricultural labor.

2.66 Table 2.24 presents the distribution of hours worked based on average number of hours worked per week during the month of adult males and females who worked for more than 40 hours. We observed the seasonality in work hours that is quite large particularly in the Northeast, and that the labor market is tight during the peak demand of labor seasons (June – July and November – December) for both males and females.

2.67 For all areas, the percentage of male reporting 40 or more hours of work per week ranges from a low of 28 percent in April to a high 43 – 44 percent in July, November and December. Seventeen percent of females reported more than 40 hours of work in April and that percentage rose to its peak in the same periods as those of males.

Table 2.24 : DISTRIBUTION OF HOURS WORKED PER WEEK (AT LEAST 40 HOURS) DURING THE MONTH PER EMPLOYED PERSONS.

(Unit : Percent)

Month	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri		All Areas	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
June	40.8	28.5	38.3	17.6	40.1	37.5	22.2	18.3	38.0	28.9
July	57.2	49.2	54.9	42.5	33.3	29.9	19.1	16.4	43.6	37.5
Aug.	50.0	36.3	38.8	25.8	39.9	39.5	31.2	28.4	42.4	34.9
Sept.	38.3	19.5	30.4	9.3	32.8	30.7	33.7	20.8	34.4	22.2
Oct.	37.4	18.2	31.0	12.7	32.2	29.4	18.6	4.9	32.2	19.8
Nov.	58.5	44.6	52.6	40.3	34.3	31.7	22.6	16.5	44.3	35.8
Dec.	50.7	37.2	34.0	23.1	45.5	42.4	38.3	33.7	44.4	36.4
Jan.	37.8	21.4	29.6	11.1	40.4	41.3	13.5	4.2	34.3	24.7
Feb.	40.5	18.0	31.5	19.6	48.2	41.9	6.8	7.8	37.4	25.9
Mar.	35.6	37.5	43.7	75.2	47.9	42.1	12.2	3.6	38.4	35.0
Apr.	28.3	11.7	25.9	16.9	32.4	25.3	16.6	6.1	27.9	16.9
May	38.1	24.1	26.2	16.8	36.0	33.4	10.4	6.1	31.7	24.4

Source: Sumala Sirichoti, *A Summary of Research on Employment and Unemployment in Rural Areas, op.cit., Tables 4-A to 4-E.*

2.68 The fluctuation of the proportions of adults males and females reporting more than 40 hours of work could imply considerable seasonal employment. This picture is clear when all data are broken down into provinces. Khon Kaen, and Roi Et, where farming remain the major working activity year round, demand for labor seems to vary significantly between seasons, and employment of females had somewhat slightly stronger seasonal fluctuations than males, which may be resulting of females voluntary withdrawal from labor force during the slack season.

2.69 The variation in the distribution of hours worked per week in Chiang Mai also follows seasonal patterns but the fluctuations in this province is the smallest of all the areas surveyed. This indicates the work opportunities available in this area so that farmers can adjust their monthly labor hours in response to the variations of labor demand. For Suphan Buri, since the non-farm activities are quite limited, farming is the primary concern of farmers. The distribution of farmers indicated the lowest level of employment as compared to other three provinces. Despite having on-going land consolidation project which prevented farmers from planting rice for one season, the seasonal pattern is still observed.

2.70 Based on all information presented so far, it is undoubtedly clear that there is a need to solve the problem of high seasonality of demand for labor in all areas. Non-farm enterprises to go along with agricultural enterprise seem to offer the best potential for increasing the return to family labor. Non-farm activities are generally more flexible than other types of work. Activities like silk-weaving, mat-making, pottery-making, brick-making are ideally suited to complement agricultural activities because farmers can adjust their timing of work. However, which non-farm activity is suitable to a particular area is subject to further analysis.

C. RELATIONSHIP BETWEEN AGRICULTURAL AND NON-AGRICULTURAL ACTIVITIES

2.71 Farm and Non-Farm Activities of Rural Households Farm and Non-Farm enterprises can be related either directly or indirectly. The development of agricultural industries can help support the non-farm enterprises. As clearly stated by the World Bank,¹ the development in agricultural industries can generate forward linkages with non-farm activities toward processing industries which enable the farmers to provide services to these industries. Therefore, each activity will provide employment opportunities to rural households.

2.72 Linkages between agricultural and non-agricultural activities are examined in Tables 2.25 and 2.26 Farm enterprises are grouped into 10 categories namely rice, kenaf and jute, sugarcane, cassava, other upland crops, fruit, vegetables, livestock and poultry, fish and shrimp and others. Non-farm enterprises are grouped into 16 categories namely noodle-making, ox-carts, silk weaving, cotton weaving, wood products, bamboo products, mat-making, pottery, bricks, hand tools, agricultural products, processing products, lacquerware, commerce, services and other products. Among these farm activities, rice and livestock and poultry are common across the regions especially during the crop season (June through December). The proportion of households which grows rice ranges from 70 percent to more than 97 percent for all regions except Suphan Buri. This figure drops as low as 30 percent during the dry season. Seasonal patterns of livestock and poultry production are similar to rice production.

2.73 Commercial rice production can generate employment to local labor market through the process of growing and processing rice. Rice can be stored over the year due to the non perishable nature of paddy. Planting and harvesting seasons are the periods of peak demand for labor. Transportation, milling and threshing activities throughout the survey region contribute to more non-farm activities in the rural areas. Livestock, unlike paddy production, is produced mostly for household consumption. Since this enterprise is also widely practiced in all sample areas, it helps generate not only employment to the farmers but also become an important source of income.

2.74 Kenaf and jute are grown in the Northeast. Producing and processing kenaf and jute (i.e. retting, drying) require a great deal of labor, thereby, generating much employment. The on-farm retting of kenaf and jute use a lot of water which are not always available in the Northeast. The quality of the fiber also depends on this factor. The production of kenaf and jute has been declining due to a lower demand, especially of foreign market. However, few years ago a new paper factory has been established in Khon Kaen which required unretted kenaf. The farmers will therefore be less dependent on water supply for retting and the labor demand for retting may drop considerably. These results are also confirmed in the study of Apibunyopas and others.² They found that the new technology of air dry kenaf resulted in a decrease in total employment of labor in the production and processing sectors of this crop. This suggests that the existence of a new pulp mill in the study region will not be attractive unless job opportunities other than those available including the pulp mill materialize. It has been found that the new technology in kenaf processing resulted in an increase in total net income of farm household in the region if the labor not used in production and processing could be employed in non-farm household or off-farm work, especially for male family labor in the areas. therefore, the promotion of other kind of non-farm products may have to be considered in order to secure this income benefit for the farm households in this region.

¹ World Bank, *Growth and Employment in Rural Thailand*, op.cit.

² Jeerakiat Apibunyopas, Timothy G. Baker, and E.W. Kenberg, "The Impact of Producing Pulp from Kenaf on Employment and Income in Northeast Thailand", (in Thai), Paper presented at a Conference on ROFEAP, Pattaya, Thailand, September 18-19, 1982.

2.75 Sugarcane can be an important source of non-farm employment mainly through its transportation requirements, cutting and locating. However, in the survey areas, only a few households produce this product. Therefore, the employment generation of this product is still very limited. The expansion of sugarcane areas elsewhere in the central-west can absorb some temporary migrant labors from the Northeast (See Table 2.25).

2.76 Cassava is another important commodity in Thailand. It requires a great deal of processing. The employment associated with the transportation of cassava roots, chips, and pellets is enormous. The recent expansion of cassava in the Northeast provide a very bright future for employment. In the study areas, there are only a small number of cassava farmers. It accounts for only 1 to 6 percent of total sample in Khon Kaen province (See Table 2.25).

2.77 Vegetable production is very popular among farmers especially in Khon Kaen and Suphan Buri where water is available. This product can generate employment through production, transportation of fresh products to the market. The future development of vegetables depend largely on the development of processing industries (See Table 2.25).

2.78 Table 2.26 presents the distribution of farm households reporting non-farm enterprises classified by province. In this section focus will be on the distribution patterns and the existence of these enterprises. The spatial dispersion of the enterprises is reflected by a strong and diverse cultural characteristics. The availability of input and consumer demand are also important.

2.79 Noodle making is about 7 percent of total households in Chiang Mai throughout the year, while farmers in the other provinces engage in this enterprise only in certain months with the proportions ranging from 1 to 5 percent of total household. Oxcart making enterprise exists only in Roi Et with only 8 percent reported working in this enterprise. Silk weaving accounts for about 16–20 percent of total households in Khon Kaen and Roi Et. This enterprise generates a lot of employment to the areas, especially during the dry season. Cotton weaving is also found in Khon Kaen and Roi Et. This activity is high during the dry season but some farmers engage in this activity year round. About 4 percent of total household in Chiang Mai engages in wood carving enterprise, year round. Similar pattern is observed in Khon Kaen but with a rather smaller number of farmers' participation.

2.80 Bamboo products are widely spread activities which are found in the North and the Northeast. The average percentages of households engaged in this enterprise are 20, 23 and 16 percent in Khon Kaen, Roi Et and Chiang Mai, respectively. Two provinces namely Khon Kaen and Roi Et reported engaging in mat-making enterprises and about 6 to 30 percent of farmers in Khon Kaen producing this product throughout the year.

2.81 There were no pottery enterprise either in Roi Et or in Suphan Buri. The year round participation in this enterprise is about 6 to 7 percent in both Khon Kaen and in Roi Et. Brick-making enterprise is found only in Chiang Mai sample area. Data reveal that about 6 percent of the total sample households engaged in this enterprise. Hand tools enterprises are also very important, except in Suphan Buri and Khon Kaen. Almost 9 percent, and 25 percent are found in Chiang Mai and Roi Et indicating the fairly large percentage of labor devoted to such activities.

2.82 Khon Kaen is an important province in terms of agricultural food processing, especially the pickling of garlic and others. The food processing activity is quite seasonal with the household participation ranging from 4 to 22 percent of the total household during the year. Roi Et and Chiang Mai also are engaged in the type of enterprise year round.

2.83 As for other enterprises, it may be summarized that small commercial stores are found everywhere in the sample areas. Lacquaware is not a common enterprise. Farmers are also engage in several kinds of services especially those farmers in Chiang Mai, Khon Kaen and Roi Et provinces.

Table 2.25 : DISTRIBUTION OF FARM HOUSEHOLDS REPORTING FARM ENTERPRISES BY PROVINCE

(Number of 4 households and percent)

Farm Enterprises	Wet Season							Dry Season					Total Number of Households
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
<i>1. Rice</i>													
Khon Kaen	127 (90.1)	121 (85.5)	119 (84.4)	123 (87.2)	113 (80.1)	115 (81.6)	134 (95.0)	136 (96.5)	137 (97.2)	50 (35.5)	43 (30.5)	45 (31.9)	141 (100)
Roi Et	57 (76.0)	56 (74.7)	56 (74.7)	52 (69.3)	52 (69.3)	62 (82.7)	63 (84.0)	64 (85.3)	64 (85.3)	2 (2.7)	1 (1.3)	1 (2.7)	75 (100)
Chiang Mai	134 (81.7)	125 (76.2)	124 (75.6)	120 (73.2)	114 (69.5)	107 (65.2)	130 (79.3)	127 (77.4)	126 (76.8)	56 (34.1)	131 (79.9)	134 (81.7)	164 (100)
Suphan Buri	1 (2.3)	1 (2.3)	1 (2.3)	—	—	2 (4.5)	26 (59.1)	23 (52.3)	8 (18.2)	—	1 (2.3)	1 (2.3)	44 (100)
<i>2. Kenaf and Jute</i>													
Khon Kaen	—	—	1 (0.7)	8 (5.7)	2 (1.4)	5 (3.5)	4 (2.8)	4 (2.8)	3 (2.1)	—	—	—	141 (100)
Roi Et	—	—	2 (2.7)	2 (2.7)	6 (8.0)	2 (2.7)	1 (1.3)	2 (2.7)	2 (2.7)	—	—	—	75 (100)
Chiang Mai	—	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)
<i>3. Sugar-Cane</i>													
Khon Kaen	—	—	—	—	—	—	5 (3.5)	4 (2.8)	1 (0.7)	—	—	—	141 (100)
Roi Et	—	—	—	—	—	—	—	—	—	—	—	—	75 (100)
Chiang Mai	—	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)

Table 2.25 : (continued)

Farm Enterprises	Wet Season							Dry Season					Total Number of Households
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
<i>4. Cassava</i>													
Khon Kaen	4 (2.8)	3 (2.1)	9 (6.4)	5 (3.5)	4 (2.8)	5 (3.5)	—	1 (0.7)	2 (1.4)	9 (0.7)	—	—	141 (100)
Roi Et	—	—	—	1	—	—	—	—	—	—	—	—	75 (100)
Chiang Mai	—	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)
<i>5. Other Upland Crops</i>													
Khon Kaen	4 (2.8)	13 (9.2)	5 (3.5)	5 (3.5)	4 (2.8)	4 (2.8)	5 (3.5)	13 (9.2)	10 (7.1)	8 (5.7)	10 (7.1)	4 (2.8)	141 (100)
Roi Et	—	—	—	—	—	—	9 (12.0)	12 (16.0)	15 (20.0)	16 (21.3)	14 (18.7)	3 (4.0)	75 (100)
Chiang Mai	4 (2.4)	5 (3.0)	3 (1.8)	4 (2.4)	4 (2.4)	3 (1.8)	6 (3.7)	3 (1.8)	3 (1.8)	7 (4.3)	30	44	164 (100)
Suphan Buri	—	—	1 (2.3)	—	—	1 (2.3)	3 (6.8)	—	—	2 (4.5)	—	—	44 (100)
<i>6. Fruit</i>													
Khon Kaen	3 (2.1)	8 (5.7)	10 (7.1)	18 (12.8)	15 (10.6)	5 (3.5)	4 (2.8)	8 (5.7)	10 (7.1)	10 (7.1)	15 (10.6)	11 (7.5)	141 (100)
Roi Et	1 (1.3)	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Chiang Mai	—	1 (0.6)	2 (1.2)	—	—	—	—	—	—	4 (2.4)	3 (1.8)	1 (0.6)	164 (100)
Suphan Buri	2 (4.5)	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)	4 (9.1)	5 (11.4)	4 (9.1)	1 (2.3)	7 (15.9)	1 (2.3)	1 (2.3)	44 (100)

Table 2.25 : (continued)

Farm Enterprises	Wet Season							Dry Season					Total Number of Households
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
<i>7. Vegetables</i>													
Khon Kaen	15 (10.6)	14 (9.9)	18 (12.8)	13 (9.2)	7 (5.0)	2 (1.4)	16 (11.3)	33 (23.4)	30 (21.3)	20 (14.2)	21 (14.9)	6 (4.3)	141 (100)
Roi Et	—	—	—	—	—	—	1 (1.3)	—	1 (1.3)	—	—	—	75 (100)
Chiang Mai	8 (4.9)	7 (4.3)	5 (3.0)	—	—	—	1 (0.6)	—	2 (1.2)	12 (7.3)	18 (11.0)	15 (9.1)	164 (100)
Suphan Buri	8 (12.2)	7 (15.9)	5 (11.4)	5 (11.4)	6 (13.6)	7 (15.9)	8 (18.2)	8 (18.2)	9 (20.5)	14 (31.8)	6 (13.6)	6 (13.6)	44 (100)
<i>8. Livestock and Poultry</i>													
Khon Kaen	128 (90.8)	124 (87.9)	124 (87.9)	124 (87.9)	120 (85.1)	124 (87.9)	119 (84.4)	117 (83.0)	112 (79.4)	19 (13.5)	23 (16.3)	22 (15.6)	141 (100)
Roi Et	66 (88.0)	69 (92.0)	67 (89.3)	68 (90.7)	64 (85.3)	67 (89.3)	67 (89.3)	66 (88.0)	65 (86.7)	1 (1.3)	—	—	75 (100)
Chiang Mai	9 (5.5)	14 (8.5)	12 (97.3)	18 (11.0)	20 (12.2)	12 (7.3)	13 (7.0)	14 (8.5)	14 (8.5)	8 (4.9)	15 (9.1)	14 (8.5)	164 (100)
Suphan Buri	6 (13.6)	3 (6.8)	8 (18.2)	5 (11.4)	4 (9.1)	—	3 (6.8)	3 (6.8)	1 (2.3)	16 (36.4)	5 (11.4)	6 (13.6)	44 (100)
<i>9. Fish and Shrimp</i>													
Khon Kaen	60 (42.6)	36 (25.5)	54 (38.3)	76 (53.9)	74 (52.5)	53 (37.6)	44 (31.2)	50 (35.5)	55 (39.0)	75 (53.2)	78 (55.3)	67 (47.5)	141 (100)
Roi Et	—	8 (10.7)	7 (9.3)	34 (45.3)	8 (10.7)	5 (6.7)	2 (2.7)	—	1 (1.3)	6 (6.0)	5 (6.7)	—	75 (100)
Chiang Mai	—	—	—	—	—	1 (0.6)	—	—	—	1 (0.6)	—	1 (0.6)	164 (100)
Suphan Buri	—	—	—	2 (4.5)	4 (9.1)	1 (2.3)	—	1 (2.3)	—	12 (27.3)	1 (2.3)	1 (2.3)	44 (100)

Table 2.25 : (continued)

Farm Enterprises	Wet Season							Dry Season					Total Number of Households
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
<i>10. Other</i>													
Khon Kaen	12 (8.5)	14 (9.9)	25 (17.7)	31 (22.0)	41 (29.1)	20 (14.2)	29 (20.6)	45 (31.9)	32 (22.7)	17 (12.1)	22 (15.6)	18 (12.8)	141 (100)
Roi Et	2 (2.7)	1 (1.3)	7 (9.3)	8 (10.7)	2 (2.7)	3 (4.0)	8 (10.7)	8 (10.7)	7 (9.3)	11 (14.7)	-	4 (5.3)	75 (100)
Chiang Mai	17 (10.4)	17 (10.4)	7 (4.3)	9 (5.5)	12 (7.3)	9 (5.5)	5 (3.0)	12 (7.3)	12 (7.3)	11 (6.7)	13 (7.9)	11 (6.7)	164 (100)
Suphan Buri	1 (2.3)	-	1 (2.3)	1 (2.3)	-	1 (2.3)	-	1 (2.3)	-	3 (6.8)	1 (2.3)	1 (2.3)	44 (100)

Source: Orasa Kiatying-Aungsulee, *Distribution of Farm, Non-Farm Enterprises in Farm Households*, Conference Paper No. 16 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1980, Table 4.

Table 2.26 : DISTRIBUTION OF FARM HOUSEHOLDS REPORTING NON-FARM ENTERPRISES BY PROVINCE

Non-Farm Enterprises	Wet Season							Dry Season					Total Number of Household
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
<i>1. Noodles</i>													
Khon Kaen	2 (1.4)	—	2 (1.4)	2 (1.4)	1 (0.7)	—	—	1 (0.7)	—	4 (2.8)	2 (1.4)	2 (1.4)	141 (100)
Roi Et	1 (1.3)	—	—	1 (1.3)	—	—	3 (5.7)	1 (1.3)	—	12 (16.0)	11 (14.7)	2 (2.7)	75 (100)
Chiang Mai	10 (6.1)	10 (6.1)	7 (4.3)	10 (6.1)	10 (6.1)	10 (6.1)	6 (3.7)	9 (5.5)	9 (5.5)	12 (7.3)	11 (6.7)	12 (7.3)	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	2 (4.5)	—	—	44 (100)
<i>2. Ox carts</i>													
Khon Kaen	—	—	—	—	—	—	—	—	—	—	—	—	141 (100)
Roi Et	1 (1.3)	1 (1.3)	—	1 (1.3)	6 (8.0)	4 (5.3)	—	2 (2.7)	5 (6.7)	—	—	6 (8.0)	75 (100)
Chiang Mai	—	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)
<i>3. Silk-Weaving</i>													
Khon Kaen	18 (12.8)	20 (14.2)	29 (20.6)	32 (22.7)	21 (14.9)	24 (17.0)	23 (16.3)	28 (19.9)	26 (18.4)	24 (17.0)	29 (20.6)	22 (15.6)	141 (100)
Roi Et	9 (12.0)	8 (10.7)	8 (10.7)	11 (14.7)	10 (13.3)	8 (10.7)	8 (10.7)	8 (10.7)	8 (10.7)	14 (18.7)	13 (17.3)	10 (13.3)	75 (100)
Chiang Mai	—	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)

Table 2.26 : (continued)

Non-Farm Enterprises	Wet Season							Dry Season					Total Number of Household
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
<i>4. Cotton-Weaving</i>													
Khon Kaen	7 (5.0)	4 (2.8)	3 (2.1)	10 (7.1)	10 (7.1)	8 (5.7)	3 (2.1)	14 (9.9)	11 (7.8)	33 (23.4)	36 (25.5)	18 (12.8)	141 (100)
Roi Et	9 (12.0)	5 (6.7)	5 (6.7)	5 (6.7)	3 (4.0)	3 (4.0)	3 (4.0)	4 (5.3)	7 (9.3)	20 (2.7)	26 (34.7)	20 (26.7)	75 (100)
Chiang Mai	1 (0.6)	1 (0.6)	—	—	—	—	—	—	—	2 (1.2)	1 (0.6)	1 (0.6)	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	1 (2.3)	1 (2.3)	—	44 (100)
<i>5. Wood products</i>													
Khon Kaen	—	1 (0.7)	1 (0.7)	2 (1.4)	2 (1.4)	1 (0.7)	2 (1.4)	4 (2.8)	2 (1.4)	2 (1.4)	3 (2.1)	3 (2.1)	141 (100)
Roi Et	—	—	—	—	—	—	1 (1.3)	2 (2.7)	3 (4.0)	1 (1.3)	—	1 (1.3)	75 (100)
Chiang Mai	6 (3.7)	5 (3.0)	6 (3.7)	7 (4.3)	6 (3.7)	6 (3.7)	5 (3.0)	5 (3.0)	6 (3.7)	7 (4.3)	6 (3.7)	6 (3.7)	164 (100)
Suphan Buri	1 (2.3)	—	—	—	—	—	—	—	—	3 (6.8)	1 (2.3)	1 (2.3)	44 (100)
<i>6. Bamboo products</i>													
Khon Kaen	16 (11.3)	12 (8.5)	20 (14.2)	32 (22.7)	28 (19.9)	11 (7.8)	11 (7.8)	16 (11.3)	20 (14.2)	28 (19.9)	31 (22.0)	20 (14.2)	141 (100)
Roi Et	11 (14.7)	11 (14.7)	14 (18.7)	16 (21.3)	19 (25.3)	10 (13.3)	10 (13.3)	16 (21.3)	17 (22.7)	21 (28.0)	19 (25.3)	17 (22.7)	75 (100)
Chiang Mai	20 (12.2)	24 (14.6)	14 (8.5)	22 (13.4)	23 (14.0)	26 (15.9)	13 (7.9)	26 (15.9)	31 (18.9)	38 (23.2)	28 (17.1)	21 (12.8)	164 (100)
Suphan Buri	—	—	—	—	2 (4.5)	—	1 (2.3)	—	—	1 (2.3)	—	1 (2.3)	44 (100)

Table 2.26 : (continued)

Non-Farm Enterprises	Wet Season							Dry Season					Total Number of Household
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
<i>10. Hand tools</i>													
Khon Kaen	1 (0.7)	1 (0.7)	1 (0.7)	2 (1.4)	1 (0.7)	1 (0.7)	1 (0.7)	1 (0.7)	1 (0.7)	1 (0.7)	3 (2.1)	1 (0.7)	141 (100)
Roi Et	15 (20.0)	12 (16.0)	11 (14.7)	12 (16.0)	14 (18.7)	14 (18.7)	15 (20.0)	15 (20.0)	17 (22.7)	19 (25.3)	19 (25.3)	18 (24.0)	75 (100)
Chiang Mai	12 (7.3)	11 (6.7)	7 (4.3)	10 (6.1)	10 (6.1)	10 (6.1)	8 (4.9)	9 (5.5)	9 (5.5)	13 (7.9)	14 (8.5)	12 (7.3)	164 (100)
Suphan Buri	-	-	-	-	-	-	-	-	-	-	-	-	44 (100)
<i>11. Processing Agr. Prod.</i>													
Khon Kaen	13 (9.2)	14 (9.9)	13 (9.2)	16 (11.3)	32 (22.7)	39 (27.7)	20 (14.2)	16 (11.3)	27 (19.1)	10 (13.3)	9 (18.0)	6 (4.3)	141 (100)
Roi Et	1 (1.3)	1 (1.3)	2 (2.7)	26 (34.7)	45 (60.0)	36 (48.0)	31 (41.3)	28 (37.3)	27 (36.0)	1 (1.3)	1 (1.3)	1 (1.3)	75 (100)
Chiang Mai	1 (0.6)	3 (1.8)	1 (0.6)	-	1 (0.6)	3 (1.8)	1 (0.6)	5 (3.0)	6 (3.7)	3 (1.8)	5 (3.0)	4 (2.4)	164 (100)
Suphan Buri	-	-	-	-	-	-	-	-	1 (2.3)	19 (43.2)	2 (4.5)	2 (4.5)	44 (100)
<i>12. Cement products</i>													
Khon Kaen	-	-	-	-	-	-	-	-	-	1 (0.7)	1 (0.7)	-	141 (100)
Roi Et	-	-	-	-	-	-	-	-	-	-	1 (1.3)	-	75 (100)
Chiang Mai	-	-	-	-	1 (0.6)	-	-	-	-	-	-	-	164 (100)
Suphan Buri	-	-	-	-	-	-	-	-	-	-	-	-	44 (100)

Table 2.26 : (continued)

Non-Farm Enterprises	Wet Season							Dry Season					Total Number of Household
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
<i>7. Mat-Making</i>													
Khon Kaen	35 (24.8)	58 (41.1)	23 (16.3)	32 (22.7)	31 (22.0)	12 (8.5)	9 (6.4)	15 (20.0)	23 (30.7)	48 (34.0)	37 (26.2)	36 (25.5)	141 (100)
Roi Et	—	—	—	1 (1.3)	4 (5.3)	—	—	1 (1.3)	—	2 (2.7)	—	—	75 (100)
Chiang Mai	—	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)
<i>8. Pottery</i>													
Khon Kaen	10 (7.1)	10 (7.1)	10 (7.1)	10 (7.1)	10 (7.1)	9 (6.4)	9 (6.4)	9 (6.4)	9 (6.4)	—	10 (7.1)	10 (7.1)	141 (100)
Roi Et	—	—	—	—	—	—	—	—	—	—	—	—	75 (100)
Chiang Mai	10 (6.1)	10 (6.1)	10 (6.1)	9 (5.5)	9 (5.5)	9 (5.5)	8 (4.9)	9 (5.5)	9 (5.5)	10 (6.1)	10 (6.1)	10 (6.1)	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)
<i>9. Bricks</i>													
Khon Kaen	—	—	—	—	—	—	—	—	—	—	—	—	141 (100)
Roi Et	—	—	—	—	—	—	—	—	—	—	—	—	75 (100)
Chiang Mai	9 (5.5)	10 (6.1)	8 (4.9)	7 (4.3)	8 (4.9)	8 (4.9)	8 (4.9)	7 (4.3)	7 (4.3)	12 (27.3)	10 (6.1)	9 (5.5)	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)

Table 2.26 : (continued)

Non-Farm Enterprises	Wet Season						Dry Season					Total Number of Household	
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr		May
<i>13. Lacquerware</i>													
Khon Kaen	1 (0.7)	—	—	—	—	—	—	—	—	1 (0.7)	1 (0.7)	2 (1.4)	141 (100)
Roi Et	—	—	—	—	—	—	—	—	—	—	—	—	75 (100)
Chiang Mai	1 (0.6)	—	—	—	—	—	—	—	—	—	—	—	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)
<i>14. Commence</i>													
Khon Kaen	5 (3.5)	6 (4.3)	10 (7.1)	9 (6.4)	8 (5.7)	9 (6.4)	8 (5.7)	7 (5.0)	6 (4.3)	12 (8.5)	8 (5.7)	7 (5.0)	141 (100)
Roi Et	4 (5.3)	3 (4.0)	5 (6.7)	7 (9.3)	6 (8.0)	5 (6.7)	4 (5.3)	6 (8.0)	5 (6.7)	9 (12.0)	10 (13.3)	7 (9.3)	75 (100)
Chiang Mai	26 (15.9)	25 (15.2)	18 (11.0)	22 (13.4)	24 (14.6)	25 (15.2)	19 (11.6)	25 (15.2)	25 (15.2)	26 (15.9)	29 (17.7)	24 (14.6)	164 (100)
Suphan Buri	1 (2.3)	—	—	—	1 (2.3)	—	1 (2.3)	—	—	3 (6.8)	1 (2.3)	2 (4.5)	44 (100)
<i>15. Service</i>													
Khon Kaen	—	3 (2.1)	1 (0.7)	2 (1.4)	2 (1.4)	—	2 (1.4)	5 (3.5)	3 (2.1)	3 (2.1)	3 (2.1)	2 (1.4)	141 (100)
Roi Et	2 (2.7)	2 (2.7)	5 (6.7)	3 (4.0)	1 (1.3)	—	4 (5.3)	3 (4.0)	4 (5.3)	7 (9.3)	7 (9.3)	6 (8.0)	75 (100)
Chiang Mai	38 (23.2)	36 (21.9)	27 (16.5)	2 (1.2)	2 (1.2)	—	1 (0.6)	2 (1.2)	2 (1.2)	4 (2.4)	2 (1.2)	48 (29.3)	164 (100)
Suphan Buri	—	—	—	—	—	—	—	—	—	—	—	—	44 (100)

Table 2.26 : (continued)

Non-Farm Enterprises	Wet Season							Dry Season					Total Number of Household
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
<i>16. Other products</i>													
Khon Kaen	15 (10.6)	13 (9.2)	15 (10.6)	20 (14.2)	17 (12.1)	9 (6.4)	8 (5.7)	12 (8.5)	9 (6.4)	19 (13.5)	22 (15.6)	15 (10.6)	141 (100)
Roi Et	2 (2.7)	4 (5.3)	4 (5.3)	5 (6.7)	4 (5.3)	3 (4.0)	4 (5.3)	4 (5.3)	5 (6.7)	3 (4.0)	11 (14.7)	6 (8.0)	75 (100)
Chiang Mai	8 (4.9)	6 (3.7)	2 (1.2)	3 (1.8)	2 (1.2)	2 (1.2)	3 (1.8)	4 (2.4)	3 (1.8)	2 (1.2)	3 (1.8)	4 (2.4)	164 (100)
Suphan Buri	4 (9.1)	4 (9.1)	3 (6.8)	3 (6.8)	3 (6.8)	2 (4.5)	2 (4.5)	2 (4.5)	-	9 (20.5)	4 (9.1)	6 (13.6)	44 (100)

Source: Orasa Kiatying-Ungsulee, *Distribution of Farm, Non-Farm Enterprises in Farm Households*, op.cit., Table 5.

2.84 The implications of this section is that there is no particular pattern of enterprise distribution. The existence of farm-and non-farm enterprises depends on a very complex set of factors including the availability of land, soil conditions, supply of irrigation water, location, access to markets and raw materials and historical specialization especially for non-farm enterprises.

Resource Use In Farm And Non-Farm Activities

2.85 To analyze the relationship between farms and non-farm activities, especially in terms of resource use and income effect, linear programming models have been constructed for typical farm-households in Khon Kaen, Roi Et and Chiang Mai. The purposes of the study are; to test economic rationality, to predict the level of resource use, to study the impact of simulated changes in resource prices and employment opportunities. Results of the studies have been summarized by Meyer and Chalamwong.¹

2.86 The results show that rural households allocate resources quite rationally and there are relatively small gains to be made through resource reallocations among existing enterprises. Average returns to labor followed a fairly consistent pattern. Farm enterprises tend to earn the highest returns, followed by off-farm work, and then non-farm enterprises. There is a range of labor earnings, so there are some enterprise that earn less than the average off-farm wage rate. Like wise, some non-farm enterprises generate returns higher than some farm enterprises and off-farm work.

2.87 There is a fairly clear division of labor by age and sex for many of the tasks involved in many enterprises. Therefore, one type of labor may be underemployed because of a shortage of another type of labor. In some periods with peak farm labor demand, all household labor is fully employed in farm enterprises. In period of slack demand, labor is allocated to other enterprises.

2.88 Result of modelling confirmed that land is a constraint for small farms because the household utilizes all available land and allocates surplus family labor to activities other than farm. When more land was introduced, more labor is allocated to farming and less to other activities especially off-farm enterprises. The models of Khon Kaen rainfed and irrigated farms show a response to wage rates. The base off-farm wage rate is set at ฿4.48 per hour for men and ฿3.75 per hour for women, then an increase of 30 percent is simulated. For rainfed farms, there is no effect on farm enterprises but households shifted out of non-farm enterprises in order to work more off the farm. For irrigated farms, there is a small decline in farm work in the dry season, and an increase in off-farm work and some changes in non-farm enterprises.

2.89 Another Khon Kaen model analyzes the important female enterprises of silkworm raising and silk-weaving. The initial off-farm female wage rate in set at ฿2.75 per hour, then raised to over ฿3.00. The simulation resulted in reduction of time spent on the silk enterprises so more time could be spent on off-farm work.

2.90 The implication of these analyses is that higher off-farm wage rates could have an impact on dry season farming and work on non-farm enterprises. There is some level of off-farm wage rate that will tend to reduce the production of both farm and non-farm products.

2.91 The Khon Kaen² models were used to test the impact of eliminating off-farm work. This simulation causes little change in farm work, but sharp increase in non-farm enterprises. Net income

¹Richard L. Meyer and Yongyuth Chalamwong, *Off-Farm and Non-Farm Employment in Thailand: A Summary of Research Results* Dept. of Agricultural Economics and Rural Sociology. The Ohio State University, Columbus, OHIO, ESO 1023, May 1983.

²Somsak Priebprom, *The Role of Farm, Non-Farm Enterprises and Off-Farm work in Household Employment and Income Generation on Irrigated and Rainfed Farms, Khon Kaen, Thailand.* Research Paper No. 7 of ROFEAP, Center for Applied Economics Research, Kasetsart University, July, 1982.

drop sharply because the additional income earned from non-farm enterprises could not fully compensate for loss in off-farm income.

2.92 The model¹ is also used to test the effect in off-farm work on farm resource use in Roi Et. The major findings of this study reveal that the composition of enterprise mix for glutinous rice, kenaf, tobacco, oxcart making, and off-farm work always appears in the final solutions for most of the models. As more hours of non-farm enterprises are introduced, the enterprise combinations change in favor of non-glutinous rice. As more labor was allocated to off-farm work, the resource use on-farm and non-farm are slightly changed, but amount of credit is eliminated from the model when farmers can raise enough income from farm, non-farm and off-farm work combined to use in the own farm production.

2.93 The Chiang Mai² Analysis uses B 1.30 as the net return per hour to non-farm enterprises when the rates was increased to B 2.75 per hour competition between farm and non-farm occur especially during the dry season. The cropping production falls and households spend more time on non-farm enterprises. These modelling analyses confirm that a delicate balance occurs in the use of resources, especially family labor, among farm, non-farm and off-farm activities. Labor use on non-farm enterprises adjusts to the changes in demand for farm and off-farm work.

2.94 Admittedly there are non-farm enterprises that offer potential increases in returns to farming labor. Eventually they could become competitive with both farm and off-farm work. But since the timing of work on non-farm enterprises is frequently more flexible than for other type of work, farm and non-farm enterprises will tend to be complementary while farm enterprises and off-farm work will tend to be competitive.

2.95 It is interesting to analyze how off-farm work affects the efficiency of resource use of farmers. An econometric model of Cobb-Douglas production functions was constructed for representative farm households in the North and Northeast to test for possible differences in technical and allocative efficiencies of farmers. The results suggest that the technical efficiency of part-time farms (worked in off-farm work more than 20 percent of total hours of work on farms and off-farm combined) may be slightly lower than full-time farms in both regions. However, the allocative efficiency results were somewhat mixed. In most cases, farmers tended to over-utilize land, labor, and capital resources, while the results for utilization of other cash expenses were mixed. Overall, full-time farms in both regions were somewhat closer to optimum allocative efficiency than part-time farms. Full-time farms in the Northeast were much closer to optimum level and labor use than part-time farms, while the opposite results were found in the North. Full-time farms seen to be closer to optimum capital use, while part-time farm seem to be closer to optimum cash expenses use.³

2.96 The implication of this analysis is that the results support the early findings that Thailand may be able to promote dual employment in rural areas without losing efficiency in farming. Since both part-time area full-time farms overutilize farm labor, it may be possible to promote the allocation of more labor to off farm work, while still maintaining satisfactory levels of farm production, and efficiency of resource use.

¹ Pattaravit Uttarin, *"Resource Allocation for Increasing Income of Farmers in Amphoe Chaturaphakpiman, Roi Et," Unpublished Master Thesis, Kasetsart University, 1981.*

² Rapeepun Jaisaad, *Results of Farm Household Modelling in Chiang Mai, Research Paper No. 26 of ROF&AP, Center for Applied Economics Research, Kasetsart University, June, 1981.*

³ Yongyuth Chalamwong, Richard L. Meyer, and Leroy Hushak, *Allocative Efficiency of Part-Time and Full-Time Farms: The Case of Thailand, ESO No. 979, The Ohio State University, Columbus, OHIO, February, 1983*

D. FUTURE TRENDS AND IMPLICATIONS

2.97 It is clear that the survey data obtained are not very useful for the analysis of future trends. The conclusions drawn from the analysis in the previous sections are that Thai-villages are extremely complex and heterogeneous with respect to the levels and patterns of rural income and employment. In fact, there has been no clear pattern with respect to income and employment among villages of different income classes. Nevertheless, it is found that income from non-farm sources is very significant for both poor and rich villages and that poor villages seem to depend relatively more on non-farm and off-farm incomes. However, this again does not lead us anywhere. It is therefore necessary to turn to other sources of information if something can be said of the future trends and its implications.

2.98 First, let us look at the interesting and relevant experiences of other countries namely Japan, Taiwan and Korea. In the period since the Second World War, these three East Asian countries have all undergone rapid industrialization which has created a great demand for labor much of which has come from the rural areas. During this period, rural industrialization has received great attention from the government as part of a strategy to promote growth with equity. In Japan, "pull factor" the availability of relatively attractive off-farm job opportunities – appears to be important for the increased off-farm employment over time. However, "push factor" has also been found to be affecting dependence on off-farm employment in some areas in Japan where farm lands are scarce. In Korea, off-farm labor demand rose sharply from 1950s due to growth in the manufacturing sector. The increased per capita income of the rural population raised demand for non-farm products which in effect helped boost the non-farm sector's growth. As for Taiwan, Ho found that both 'push' and 'pull' factors explained the increased off-farm employment.¹ Furthermore, as stated by Ho, "by allowing rural industry and agriculture to grow in a mutually reinforcing manner, decentralized industrialization has created employment opportunities and enabled greater numbers of Taiwan's rural population to participate in industry without having to leave the countryside".²

2.99 As a result of the expanding off-farm employment among the rural households in these three countries, the structure of rural income changed drastically over time. Farm income of the rural households has been greatly decreased relative to non-and off-farm incomes. For example, during 1960 to 1975 income from off-farm sources in Japan grew from 50 to 71 percent of average rural household income, while in Taiwan the share grew from 13 to 43 percent. All farm size groups have substantially increased their income through off-farm work in the three East Asian Countries during the period. However, the small farmers increasingly depended on off-farm income. It represents 50 to 90 percent of rural household income on farm with less than one-half hectare of land, whereas on farms over two hectares it represents 15 to 30 percent of household income. Off-farm work has therefore had positive impact on the poverty problems in these countries.³ In fact, part-time farming has become a common phenomenon in these countries as well as in many developing countries in the world. Based on these experiences, a clear trend has emerged. That is, non-and off-farm income and employment will be of increasing importance while agricultural income and employment will be the reverse.

2.100 Turning now to the case of Thailand. Some data over time are available and may provide some insight into the future role of off-farm employment. Onchan and Chalamwong used data from farm survey by the Office of Agricultural Economics(OAE) to study non-and off-farm income during 1971/72 to 1975/76 and concluded that "non-farm income is quite significant in all regions especially in the South, Northeast and North. For the whole kingdom, it constituted 46 percent of the total net

¹ Samuel P.S. Ho, *The Rural Non-Farm Sector in Taiwan, Studies in Employment and Rural Development*, No. 32, World Bank, Washington D.C., September, 1976.

² Samuel P.S. Ho, *Studies in Employment and Rural Development*, *Ibid.*

³ Samuel P.S. Ho, *Studies in Employment and Rural Development*, *Ibid.*

Table 2.27 : ANNUAL COMPOUND REAL GROWTH RATES OF NON FARM INCOMES OF FARM HOUSEHOLDS, GDP AND EMPLOYMENT, 1971/72 – 1978/79.

	Regional Employment		Real Regional GDP		Off-Farm Income
	Non-agri	Agri	Total	Agri	Total
Whole Kingdom	–	–	7.8	7.2	12.3
North	9.6	1.4	6.0	5.4	11.7
Northeast	3.5	3.6	6.7	5.5	12.6
Center	5.8	3.6	8.1	8.6	10.7
South	9.6	1.9	9.7	9.4	13.0

Source: World Bank, *Growth and Employment in Thailand, op.cit., page 28, Table 2.2.*

cash income. This proportion increased to 55 percent in 1975/76. The increase was particularly remarkable in the poor region of the Northeast where an increase from 48 percent to 66 percent was observed".¹

2.101 A study of the World Bank using data from the same source and covering the period of 1971/72 to 1978/79 also reveals an interesting finding.² (See Table 2.27) While the annual compound real growth rates of regional GDP for the whole kingdom is 7.8 percent, the rate for off-farm income is 12.3 per cent as compared with only 7.2 percent of agriculture. Growth rates of off-farm income for all regions are higher than 10 percent and are considerably higher than those of agriculture. The data clearly show a relatively high growth of the non-and off-farm sector-the general pattern of economic growth in the country. Furthermore, regional employment in nonagriculture has grown at a relatively high rate in most regions. The low growth rate of non-agricultural employment in the Northeast indicates a slow growth in the non-agricultural sector.

2.102 Based on the available data, something may be said of the future trends on rural income and employment in Thailand. Non-and off-farm employment and income will be increasingly important in all regions. 'Push factor' will be the dominant one for the increase in rural, off-farm employment. However, pull factor may become important if the current policy of rural industrialization is effectively implemented.

2.103 Finally, what are the implications of the future trends? As one visualizes the increasing participation of the rural population in non-and off-farm employment, the rural manpower must have the necessary skills required to operate, manage and/or work on off-farm enterprises. Training or non-formal education is required to prepare them for the work. Non-farm enterprises (those operated and managed by household members) also need good management and skilled labor (like handicrafts and furniture). If this type of enterprise is to be promoted, all aspects of product development and marketing must be greatly improved. To seek jobs in towns and cities, the worker must have some skills and information especially when the demand for such job is only seasonal or during the off-farm periods.

¹ *Tongroj Onchan and Yongyuth Chalamwong, Rural Off-Farm Employment and Income of Rural Households in Thailand: Some Research Findings, Research Paper No 4 of ROFEAP, Center for Applied Economics Research, Kasetsart University, October, 1981.*

² *World Bank, Growth and Employment in Thailand, op. cit.*

2.104 Promotion of non-farm enterprises, as will be discussed in details in the next chapters, cover all levels and all ranges of products. Village non-farm enterprises can be very significant in certain areas (like Chiang Mai and Khon Kaen). At present, they are faced with a variety of problems. Some enterprises offer great potentials (like silk and handicrafts). Assistance from private and public agencies is required for their development and growth. Town industries (like furniture, cement products, food processing) also offer great potentials provided that infrastructural facilities are accessible and incentives are given. Problems facing these local industries have become increasingly recognized, if they can be solved the industries can be expanded. This, in turn, will help absorb a great amount of rural labor. Rural industrialization is therefore an appropriate policy which should be seriously undertaken if the rural welfare is of a primary concern of the government.

Chapter 3

Village Industry

by

Pradit Charsombut

VILLAGE INDUSTRY

3.01 Agricultural development is considered to be an important strategy in the process of rural development. Other activities such as cottage industries and services, are considered to be supplementary or secondary jobs of the rural people. The promotion of non-farm activities for the rural people has not been paid much attention from economic planners and policy makers. Though agriculture is a main occupation the rural people in some areas are engaged in non-farm activities such as cottage industries, services, trades and other manufacturing activities. Among these, cottage industries and other manufacturing enterprises of rural households which are called "village industry" in this paper have been practised in many areas in Thailand. However, it is commonly believed that a non-farm enterprise in the village is only a supplementary or secondary job of a farm household. Such an activity is operated during the slack season from agriculture. Furthermore, it is believed that manufacturing by a rural households does not have economic viability. Production of a cottage industry has a tendency to decline as the economy grows. Partly because of these reasons, the village industry has not been developed in Thailand. Recently, some studies reveal that non-farm activities in rural areas appear to provide a source of employment for 30 to 50 percent of the rural labor force. Hence the government of some developing countries as well as certain international organizations have paid much attention to the potential of income and employment generation through an expansion of non-farm activities in rural areas.¹

3.02 In Thailand, it is realized that low income and lack of employment is a crucial problem in rural areas. Farmers, who are the majority of the rural people have low income, on the average of about 46 percent of the average income of the urban people.² The poverty of the rural people is believed to be associated with their poor employment conditions. Not only seasonal unemployment but also under-employment have existed in some rural areas. During the dry season, job opportunities are limited due to a small number of manufacturing and services establishments in rural areas. Attempts to encourage large scale industries to locate in rural areas have been made but these have met with little success.³

3.03 As far as job opportunity of the rural people is concerned, it may be helpful to promote village industry to become an important source of income and employment of rural areas. Understanding about village industry will help policy makers and planners to develop policies and development programs for village industry.

A. OBJECTIVES AND METHODOLOGY

3.04 The main objective of the study is to investigate the potential for increases in income and employment of the rural people through the expansion of village industry. To understand its potential,

¹ C. Enyinna, and C. Liedholm, *Rural Non-Farm Employment: Review of the State of the Art*, MSU Rural Development Paper No. 4., East Lansing, Michigan, 1979.

² National Statistical Office, *Socio-Economic Survey, 1975/76*, Bangkok, 1978.

³ C. Isarangkun, *Development of Agro-Industries, Small-Scale Industries, Industries Satisfying Basic Needs of the Poor and Dispersal of Industries: Government Policies and Measures in Thailand*, NIDA, 1979.

the study aims to investigate the extent and compositions of village industry; to analyze operational characteristics and roles of village industry in income and employment generation for rural households; to define and to analyze the relationships of household manufacturing, agriculture and off-farm work; and to determine problems of village industry and the potential for facilitating on expansion of village industry through the changes in marketing arrangements, production patterns, and availability of inputs used for village industry.

3.05 The data used in the study are obtained from Phase I survey and the longitudinal survey of the Rural Off-Farm Employment Assessment Project (ROFEAP) of Kasetsart University. The data from Phase I survey which are obtained from village headman interviews and household surveys in 1980 provide an overview of village industry in 4 provinces of Chiang Mai in the North, Khon Kaen and Roi Et in the Northeast, and Suphan Buri in the Central Plain. The data from the longitudinal survey of 424 households in 26 villages in the provinces, provide the operational characteristics of manufacturing by rural household in the villages. Other sources of information are also collected for comparisons.

3.06 The study will illustrate an overview of manufacturing in the villages with the emphasis on an extent, composition and its growth in the first section. A comparison of the ROFEAP study and other studies will be also made. The following section will provide the analyses of operational characteristics of manufacturing by rural households with the emphasis on the roles in income and employment generation and relationships of manufacturing enterprises by rural households to other activities. Policy implications and programs for village industry development will be discussed in the last section.

B. AN OVERVIEW OF MANUFACTURING BY RURAL HOUSEHOLDS

The Extent and Composition

3.07 It is generally believed that cottage industry has been practised by farm households in many areas of Thailand. Some industries such as silk production and cotton weaving have been traditionally practised for a long time. The results of Phase I survey of ROFEAP as shown in Table 3.1 reveals the variety of manufacturing operated by rural households. However, types and concentration of manufacturing vary among the areas studied. In Chiang Mai and Khon Kaen, various types and a greater number of manufacturing enterprises were found in villages. A relatively small number of household manufacturing types were found in Roi Et, a relatively poor province in the Northeast. In Suphan Buri, where modern agricultural production exists, a few types and number of manufacturing by farm households were found. Some types of manufacturing such as basket making, tailoring and dress making, silk and cotton weaving, carpenter and rice mills were commonly found in all areas studied. Other manufacturing enterprises such as bricks, wood carving and fish nets were found in some specific areas, probably depending on the availability of raw material supplies, skills of workers and local demand.

3.08 Selectively, village headman interviews were made. Among 21 villages in 3 districts in Chiang Mai, the survey found 2,275 manufacturing enterprises among 3,095 households. The major enterprises found in Chiang Mai are bamboo products, tailoring and dress making, and wood carving. In Khon Kaen, 24 villages were visited and 3,006 manufacturing enterprises were found in 3,633 households. The most important manufacturings by farm households are silk weaving, cotton weaving, mat making and bamboo product making. In Roi Et, 16 villages were visited and 854 manufacturing enterprises, or a relatively small proportion of manufacturing were found. Major types of manufacturing by rural households in this province are basket and rice container making, silk weaving and blacksmithing. In Suphan Buri where advanced agricultural production has been practised, no major manufacturing by households was found, except carpentry.

Table 3.1 : PHASE I SURVEY, VILLAGE HEADMAN INTERVIEWS: NUMBER OF HOUSEHOLDS AND PERCENTAGE OF HOUSEHOLDS WITH MAJOR NON-FARM ENTERPRISES, 1980^a

	Purposive Selection				Random Sampling		
	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Chiang Mai	Khon Kaen	Roi Et
No. of Villages	21	24	16	11	34	28	35
No. of Households	3,095	3,633	1,651	2,246	6,418	2,939	3,580
No. of Non-farm Activities	2,275	3,006	854	128	n.a.	n.a.	n.a.
Percentage of Households with each Non-farm Enterprise	100	100	100	100	100	100	100
Rice Mills	1.42	2.15	1.33	0.22	not reported		
Silk	1.23	22.49	8.90	0.0	0.0	34.67	23.21
Dress Making, Tailoring	6.10	2.48	1.27	0.0	1.6	40.25	41.51
Fish Nets	0.0	3.44	0.0	0.0	0.0	10.14	6.23
Carpent -	11.24	11.06	9.39	3.03	0.0	0.14	0.06
Wood Carving	5.80	0.0	0.0	0.0	0.59	0.0	0.03
Baskets	2.68	5.75	13.26	0.0	1.46	7.08	16.51
Bamboo Products, Mats	24.49	26.56	0.0	0.0	4.96	33.21	31.01
Bricks, Pottery	2.52	0.0	0.0	0.0	2.58	0.0	0.0
Cement Products	3.65	1.62	0.0	0.0	0.0	0.0	0.0
Blacksmiths	0.0	0.0	6.60	0.0	1.12	0.14	0.06
Machinery Repairs	0.78	1.49	0.24	0.31	0.0	0.0	0.0
Thai Noodles	0.0	0.0	0.0	0.0	0.39	1.74	0.0
Tobacco Curing.	0.0	0.0	0.0	0.0	2.09	0.0	0.0
Others	10.73	2.45	7.33	0.67	not reported		

^a One household may have more than one non-farm enterprise

Source: Rural Off-Farm Employment Assessment Project

3.09 By stratified random sampling of districts and villages, respectively, 34 village headmen in Chiang Mai, 28 villages headmen in Khon Kaen and 35 villages headmen in Roi Et, were interviewed about the existing enterprises in the villages. A variety of manufacturing enterprises in the area surveyed were found, and a similar conclusion about types and the extent of a village industry can be made. The data from Table 3.1 indicate larger proportions of households with some enterprises such as bamboo product making, silk and cotton weaving in Khon Kaen and Roi Et. However, this does not mean that village industries in Khon Kaen and Roi Et have more economic viability than that in Chiang Mai. It just indicates that a larger proportion of rural households in Khon Kaen and Roi Et engaged in manufacturing enterprises during a year. The survey found that a number of manufacturing enterprises are operated by a household in the Northeast but they are operated at a shorter period during the slack season of agriculture.

3.10 By random sampling of households in the villages selected, the survey of 4,873 households in 34 villages in the areas studied found at least a major manufacturing by households in 25 villages.

Among 1,624 households interviewed, at least 766 households or about 47 percent of the total households have a major manufacturing enterprise. Most of the major manufacturing found are bamboo product making, mat making, silk weaving and cotton weaving. Among 689 households interviewed in 12 villages in Chiang Mai, 340 households or a half of household engaged in a major manufacturing enterprise. In Khon Kaen, 418 households in 10 villages were interviewed. The impressive proportion, 76 percent of households interviewed engaged in manufacturing enterprises. In Roi Et, one of the poorest province in the Northeast, 278 households in 8 villages were interviewed. Among these households, only 109 households or about 39 percent engaged in major manufacturing enterprises. In Suphan Buri, 230 households in 4 villages were interviewed, no major manufacturing by households was not found. (See Table 3.2) The results of households survey confirm the existence of a variety of manufacturing by households in the areas studied as it was reported by the village headman.

Table 3.2 : HOUSEHOLD INTERVIEWS : SOME CHARACTERISTICS OF HOUSEHOLDS SURVEYED IN CHIANG MAI, KHON KAEN, ROI ET AND SUPHAN BURI, 1980.

Characteristics	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri
Total Number of Villages	12	10	8	4
Total No. of Households				
in Village	1,961	1,507	763 ^a	642
in Sample	698	418	278	230
No. of Households with a Major Manufacturing Enterprise				
Bricks	25	—	—	—
Cotton Weaving	11	30	—	—
Baskets and Other				
Bamboo Products	97	44	34	—
Wood Craft	51	—	—	—
Noodle	19	—	—	—
Mats	9	93	—	—
Blacksmiths	47	—	22	—
Pottery	23	18	—	—
Silk	—	132	21	—
Salt	—	—	10	—
Ox Carts	—	—	22	—
Non-major (several)	58	several	—	—
Pop. of Working Age				
Total	2,711	1,973	1,264	955
Working in h.h. in Agriculture	2,108	1,434	1,005	839
Working in h.h. in Non-agriculture	1,455	627	314	42
Working outside Village	661	337	238	107
H.H. with Year-round Irrigation for Agriculture	285	95	2	121
Average Farm Size in Rai	7.7	23.1	22.2	31.6

^a7 villages only

Source: Rural Off-Farm Employment Assessment Project

3.11 The information of the household interviews give some different pictures of the village industry in Chiang Mai and in the Northeast. First, although varieties of manufacturing have been practised in all areas studied, but more varieties of manufacturing were found in Chiang Mai as a few types were found in Khon Kaen, and Roi Et. Second, a high concentration and specialization of manufacturing by households in villages was found in Chiang Mai. Blacksmithing, wood carving and dress making were found in certain villages. Differently, in Khon Kaen and Roi Et several types of manufacturing appear in many villages but each type was operated by a relatively small number of households in villages. Third, manufacturing in Chiang Mai was produced all year-round, as 69 percent of the household labor force was reported to work in manufacturing enterprises. The proportion of the labor force working in manufacturing was relatively high as compared to 43 percent and 31 percent of that in Khon Kaen and Roi Et, respectively. Fourth, within an industry or in some production line, various products with more developed designs were found in Chiang Mai. In Khon Kaen and Roi Et, traditional products with less developed designs were found. The different features of the village industry in Chiang Mai and in the Northeast indicate the different degree of manufacturing production by rural households in the areas studied.

3.12 It is possible that the differences in village industry are related to 4 major factors—local raw materials, characteristics of agriculture, local markets and levels of skills of workers. In Chiang Mai, availabilities of teak, clay and tobacco leaves are the major sources for wood carving, brick and pottery, and tobacco curing, respectively. A small size of farm land in Chiang Mai may be a pressure to push a farm household to have a manufacturing enterprise as another main occupation. However, the data from Phase I survey cannot explain much about the relationship of irrigation and the extent of village industry. The local market of manufacturing products is relatively large in Chiang Mai. Not only local consumers but also tourists are the major sources of the demand for manufacturing products made by rural households. In Khon Kaen and Roi Et, most of the manufacturing products are sold in the local and regional market. Moreover, it is possible that an average worker in Chiang Mai has a higher level of skill in manufacturing than an average worker in the Northeast since the extension and promotion of manufacturing has been made by the Department of Industrial Promotion, particularly Industrial Service Institute in Chiang Mai.

Comparison of Phase 1 Survey Results with Other Sources of Data

3.13 Since the Phase 1 survey results are drawn from the survey made by purposive selections of the provinces, districts and villages, respectively, there is the problem of generalizing the results. To evaluate the results of the survey, a comparison of Phase 1 results and other sources of data will be discussed. In the village survey, the headman interviews and the household interviews provide the results with a similar conclusion. Among the villages where the household interviews were made, the results of 8 villages in Roi Et and of 10 villages in Khon Kaen can be compared with information from the National Statistical Office (NSO). The latter data are taken from worksheet summarizing a variety of NSO survey in villages. The comparison of the data are shown in Table 3.3. On the whole, one might say that the agreement is quite good in two villages in Roi Et where concentration of a major manufacturing enterprise exists in the village. The agreement is quite poor among the remote villages and in the villages where no major manufacturing enterprise exists. The data in Table 3.3 indicate a non-existence of manufacturing in the villages as reported by NSO, but a number of households with manufacturing were found in Phase 1 survey. Another source of information, the annual report of the socio-economic characteristics of villages prepared by a community development worker tends to confirm the results of the Phase 1 survey.

3.14 In the process of data collection, provinces, districts and villages were selected in such a way as to reflect different typologies known to exist in the country. Roi Et was chosen as a representative of the poor province of the Northeast with the characteristics of the poor land and the rainfed area.

Table 3.3 : COMPARISON OF PHASE I VILLAGE SURVEY RESULTS WITH NSO DATA IN SOME VILLAGES IN KHON KAEN AND ROI ET

Province	Village I.D. NO.	Number of Households Participating in Manufacturing Enterprises as Reported in			Type of Enterprise
		Headman Survey	Household Survey	NSO Data	
Roi Et	1	77	75	50	Bamboo Products
	2	100	84	80	Blacksmiths
	3	27	33	170	Not specified
	4	8	12	69	" "
	5	60	42	0	" "
	6	91	48	0	Silk
	7	50	44	0	Ox Carts
	8	30	9	0	Not specified
Khon Kaen	5	273	360	0	Bamboo & Mats
	6	58	54	0	Mats
	7	46	42	0	Not specified

Source: Donald C. Mead, and Pradit Charsombut, Rural Off-Farm Employment in Thailand: Phase I Survey Results Research Paper No. 1 of ROFEAP, Center for Applied Economics Research, Kasetsart University, June 1980, Table 18, P. 52.

Khon Kaen is a more developed province in the same poor region with more growing urbanization and rural industrialization. Chiang Mai is a province known for its extensive non-agricultural activities and a diversification of agricultural production. Suphan Buri is a province with modern agricultural production with an extensive irrigation and increasing agricultural mechanization. This province was included in the survey in order to provide contrast between a modern agricultural province and other provinces. Each of these provinces selected for study is representative in terms of a variety of socio-economic characteristics such as types and pattern of agricultural production, types and composition of non-farm enterprises. The results of the survey are in a fundamental sense representative of the villages and the areas with similar socio-economic characteristics.

3.15 Outside the ROFEAP study areas the additional survey found the existence of some major manufacturing enterprises in various rural areas of Thailand.¹ Silk weaving and cotton weaving by rural households were found in all provinces in the Northeast. Particularly in Chaiyaphum, Surin and Nakornrajsima provinces, silk weaving and cotton weaving are quite well known. Cotton weaving in Songkla, the Southern province, is also well known in the local market as well as the national market.

¹ See Pradit Charsombut and Rangsit Poosiripinyo, *Mat Production in the Northeast*, Conference Paper No. 28 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981, Sungvean Chanthongkaew, *Hand Tools Industry in Roi Et and Chiang Mai*, Research Paper No. 12 of ROFEAP, Center For Applied Economics Research, Kasetsart University, August, 1982, Sompong Orapin, *A Descriptive Analysis of Cotton Weaving Industry in Rural Areas in Thailand*, Conference Paper No. 19 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981, and Vilailuck Thaiusa, *A Case Study on Bamboo Product Industry in Khon Kaen, Roi Et and Chiang Mai Provinces*, Conference Paper No. 20 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981.

Bamboo product making was found in many areas of Thailand. Various types of bamboo and cane products were found in Chonburi, Angthong, in the Central Plain, Chaiyaphum and Yasothorn provinces in the Northeast. Knives and hand tools were found in Ayuthaya. The high quality Chantaboon mats are produced in Chanta Buri province. The additional surveys outside the ROFEAP study areas provide the picture of the extent and composition of manufacturing enterprises in many rural areas.

3.16 Another survey on rural farm and non-farm enterprises of rural households was made in 11 provinces by a team of World Bank in cooperation with researchers from several universities and Office of the National Economic and Social Development Board.¹ The survey found a variety of rural non-farm enterprises in different areas. Clothing and tailoring was commonly found in all areas surveyed. The major manufacturing enterprises such as brick and ceramic products were found in Chainat, a province in the Central Plain, Chonburi in the East, Sukothai in the North, Chumphon in the South and Kalasin in the Northeast. Welding and fabricating was found in Chainat, Sukothai, Chumphon and Chonburi. It is expected that some other non-farm enterprises will be found if the survey is conducted in other areas.

3.17 Based on the data of the Socio-Economic Survey in 1975/76, the World Bank's studies² tried to categorize village households into farm and non-farm households. The data of the study indicate that about 17.3 percent of total households in villages were non-farm households. The majority, 82.7 percent of the village households were farm households by this definition. Based on the definition of a farm household which has an agricultural enterprise, one may expect to see a relatively large proportion of farm households. Typically, even a household of a teacher or a household of a retailer in a village usually has an agricultural enterprise in the household. By this definition the household of a teacher with a small piece of paddy production farm land is counted as a farm household. The classification is hard to accept if major source of the household's income comes from the teacher's salary.

3.18 In Table 3.4 the proportions of non-farm households vary among regions, from 7.7 percent in the Northeast-Upper where Roi Et and Khon Kaen are included, to 36 percent in the Central-East. These proportions are relatively high compared to 5 percent of the rural households which have non-agricultural enterprises as found in the ROFEAP study. If a part-time farming household was included in non-farm households, the proportion of non-farm households increased to about 32 percent for the whole country, about 35 percent in the North-Upper and about 20 percent in the Northeast-Upper. However, the proportions were relatively low compared to 58.7 percent of households with had both agricultural and non-agricultural enterprises operated by there household members. Although the proportion of non-farm households in Table 3.4 included all manufacturing, trades and services, the data provide a broad picture and the importance of manufacturing enterprises operated by rural households.

Changes in Manufacturing by Rural Households

3.19 Observations made by some studies³ indicate that the rural people in isolated areas and in subsistence agriculture favor home production of cottage industries. As income of household and transportation among locations improve, a substitution of home produced manufacturing products such as textile goods and water containers by imported one is made. In the Central Plain, household textile

¹ *The World Bank, Growth and Employment in Rural Thailand, Report No. 3906-Th., East Asia and Pacific Regional Office, April 13, 1983.*

² *The World Bank, Growth and Employment in Rural Thailand, ibid., Table 2.6, page 36.*

³ *See discussions in J.C. Ingram, Economic Changes in Thailand, 1850-1970, Stanford University Press, 1971; and IBRD, Growth and Employment in Rural Thailand, op. cit., pp. 78-81.*

Table 3.4 : DISTRIBUTION OF HOUSEHOLDS IN VILLAGES BY TYPE AND REGION, THAILAND, 1975-76

(Percent)

Region	Farm ^a	Non-farm ^b	Non-farm ^c	Total a & b
North-Upper	83.9	16.1	35.3	100
North-Lower	84.3	15.7	25.1	100
Northeast-Upper	92.3	7.7	19.6	100
Northeast-Lower	87.7	12.3	22.6	100
Center-West	82.9	17.1	31.3	100
Center-Middle	79.0	21.0	36.9	100
Center-East	64.0	36.0	47.0	100
South-Upper	81.7	18.3	42.4	100
South-Lower	83.6	16.4	44.4	100
Greater Bangkok	41.4	58.6	66.2	100
Whole Kingdom	82.7	17.3	31.7	100

^a A farm household is one which has an agricultural enterprise. It includes households with agricultural enterprises but whose heads are not in the agricultural sector but exclude households without agricultural enterprises whose heads work in the agricultural sector.

^b A non-farm household is one which has no an agriculture enterprise.

^c Percent of households includes non-farm households and farm household whose heads are not in the agricultural sector.

Source: Calculated from the data tapes of *Socio-Economic Survey, 1975/76*, National Statistical Office. Shown in Appendix Table 1.

production and some cottage industries have virtually disappeared as a specialization in rice production for exports has increased. The data from Socio-Economic Surveys in 1968/69 and 1975/76 indicate declining proportions of households owning looms and mat making machines in all areas. However, the study has nothing to say about a declining absolute number of looms and total production of the products in the whole country.

3.20 The ROFEAP study has found that in some areas such as in Khon Kaen, Chaiyaphum and Chiang Mai, rural people work on cotton and silk weaving without owning looms. In some cases, cloth weaving firms in towns provide looms and some other equipment for rural households for cloth weaving. The findings indicate changes in terms of entrepreneurship and production patterns of cotton and silk weaving in rural areas have occurred.

3.21 By special interviews of 424 households observed in the longitudinal survey, the study has found that only 15 percent of those currently engaged in some form of manufacturing production have previously started in other lines. The most commonly reported other manufacturing activities are cotton and silk weaving, mat and hat making. The reasons given for shifts of the product lines are low income earned, shortage of raw materials and the limited market for the products. Concerning about the future, about 10–20 percent of the producers in ox-carts, bricks and hand tools have stated that they would not encourage their children to enter these fields in which they were engaged.

3.22 Most village manufacturing producers seem to stick with a particular line of production for many years, on the average of 26.7 years. Some production lines such as silk and cotton weaving have

40 years of age, the longest average number of years the producers have been in business. Bricks, ox-carts, and baskets have an average of less than 15 years. Wood products have an average of age in production of less than 10 years, indicating the newest manufacturing enterprise operated by rural households in the study areas.

3.23 Over half of all village manufacturing producers have indicated that they were introduced to a particular product line by neighbors in their village. Only in a few cases did people report having been led into a certain production line by outsiders such as commodity development workers, extension workers and merchants. This tends to explain how a rural household enters the manufacturing production and to indicate the important means of expanding manufacturing enterprise by a village leader in a production line.

3.24 The striking changes in village industries were product modification. Less than half of all producing respondents have reported any modification in the products they make. Modifications in size, design, production technique, raw materials used and color have been found in the cases of pottery and mat making. At the opposite end of the scale, no vital product modification in bricks, ox-carts, and hand tools, it was reported that one third to one half of all producers had some product modification in size, color and production techniques. The reasons for the product modifications were the responses to the changing market demand and to the changing supply of raw materials. The picture of changes in production line and product modification of a village industry indicate that most of the rural manufacturing producers behave rationally in responses to the market force.

C. OPERATIONAL CHARACTERISTICS OF VILLAGE INDUSTRY

Production Patterns

3.25 In the longitudinal survey of the ROFEAP study, 424 households in 26 selected villages were drawn randomly. Among these households, 141 households in 9 villages are in Khon Kaen; 75 households in 5 villages are in Roi Et; 164 households in 9 villages are in Chiang Mai, and 44 households in 3 villages are in Suphan Buri. The longitudinal survey provides not only the data of production activities in farm and non-farm enterprises, but also the performances of the enterprises of households. The survey has found that 95 percent, 92 percent, and 78 percent of households in Khon Kaen, Roi Et and Chiang Mai, respectively, had any of 10 major manufacturing enterprises of the household during the period of 12 months (March 1980 – February 1982). The high proportions of households with manufacturing enterprises indicate the importance of the enterprises among the households which were drawn randomly in the villages selected. Based on the data, the intensity of manufacturing by households in the areas studied can be observed. Certainly, the intensity of manufacturing enterprise may vary among households, which will be discussed in terms of labor uses and income of a household in other part of this paper. In Suphan Buri, the longitudinal survey has found that a small proportion of households operated manufacturing enterprises over the period of 12 months, confirming the non-existence of the major manufacturing enterprises in this area. Therefore, the analysis excludes Suphan Buri from the study.

(a) Products

3.26 The production pattern of village industries vary in terms of products, process of production and input uses. The major industries as shown in Table 3.5 were found in the longitudinal survey. In terms of proportion of households with manufacturing enterprises, the data in Table 3.5 confirm the results of Phase I survey, indicating the intensity of silk and cotton weaving, bamboo product and mat

making in Khon Kaen and Roi Et, but more equal distribution by type of manufacturing enterprises in Chiang Mai.

3.27 Within an industry, products also vary by form, size, quality and uses. For example, knives, axes, hoes, spades and sickles are the products of blacksmithing. These products have difference in forms and in uses. Besides, a big knife and a small one can be used for different purposes. Though the variations in the products within each industry may reflect the performances of industry, it is difficult to make analyses by kind of products. The variations of products by groups of industry and location can be made. By group of industry, wood carving, blacksmithing, bamboo product and pottery making have much variation in terms of forms, sizes and uses of the products. The products of silk and cotton weaving, mat making, have variation in terms of quality and size of products. Less variations were found in the products of Thai noodles, ox-carts, and bricks. By locations, it was found that within a certain industry such as bamboo product making, only baskets and sticky-rice containers were commonly found in Khon Kaen, as various kinds of bamboo products were found in Chiang Mai. Differences in quality of products were also found among locations. Basket making and sticky-rice containers made in Roi Et and in Chiang Mai have higher quality than that made in Khon Kaen. The silk fabric in Khon Kaen has higher quality than that in Roi Et. These differences in quality are expected to reflect the differences in prices and returns to labor of each type of products.

Table 3.5 : A SUMMARY OF MAJOR PROBLEMS IN MANUFACTURING BY RURAL HOUSEHOLDS

Industry	Product Market	Local Raw Material	Level of skills Required	Characteristics of product
Thai Noodles	local	—	—	perishable
Ox Carts	local	wood shortages	high	—
Silk	local	native silk yarn shortages	high in some	—
Cotton Weaving	local	high price of cotton yarns	—	—
Wood Crafts	—	wood shortages	high	—
Bamboo Products	local	wood shortages in some areas	—	—
Mats	local	water reeds shortages in some areas	—	—
Pottery	local	clay shortages in some areas	—	—
Bricks	local	clay shortages in some areas	—	heavy
Handtools	local	rising price of steels; shortages of charcoals	high	—

(b) Entrepreneurship

3.28 Most types of village industries are operated by households. The management and decision making in the household manufacturing enterprise depends on a household head or a housewife. In many cases, the allocation of the family labor is related to a farm enterprise of household.

3.29 A group with 2–3 members from different families join the production of blacksmithing which requires at least two strong workers in the process of production; and female workers do not work in the production process. The family with single man joins another to work on blacksmithing. Expenditures in production are commonly shared, except for iron bars in some cases.

3.30 Another form of entrepreneurship is a subcontracting arrangement to a rural household. The arrangement is undertaken by producers in a parent firm in towns providing raw materials and sometimes necessary tools and equipment, paying on a piece-work basis for rural people working in their own homes to complete a partial step, or all steps in production. The subcontracting work can be done by household members. This system is widely used in silk and cotton weaving in Khon Kaen, Chaiyaphum and Nakornrajasima; ready-made garments, wood carving, and furniture making in Chiang Mai.¹

(c) Production Process and Technology Uses

3.31 The production processes vary widely among industries and products. Some industries such as the patterned silk fabric production requires several steps in production; but bamboo product and mat making requires less steps in production. The details of production process of each industry can not be discussed in this paper.

3.32 As it is already expected, a labor intensive technique in production is commonly found in the household manufacturings. Simple tools and equipments are employed in the production. Among the major industries studied, relatively more investments in tools, equipment and workshop are found in hand tools and brick making. Within a certain industry such as pottery, bamboo product making and silk weaving each has differences in tools and technology uses among areas. For example, basket and rice container making, steaming bamboo strips in chemical water and smoking bamboo stems before stripping were found in Chiang Mai and Roi Et, respectively; but the process was not found in bamboo product making in Khon Kaen. Thrown silk with an iron frame were employed in silk production in Khon Kaen; but local equipment and traditional techniques in silk weaving were found in Roi Et. The differences in technology and equipment uses in the production processes create differences in the quality of products. On the average, the silk fabric in Khon Kaen has higher quality than the silk fabric in Roi Et.

(d) Labor and Skills

3.33 Family labor is a major component in all types of village industry. Hired labor is hardly found. The female labor force constitutes a high proportion in silk and cotton weaving and mat making while the male labor force takes a major share in ox-carts, blacksmithing, wood carving. In other 4 industries, both sexes takes a close proportion of labor uses in the production.

¹ See the details in Donald C. Mead, *Subcontracting in Rural Areas of Thailand*, Research Paper No. 5 of ROFFAP, Center for Applied Economics Research, Kasetsart University, November, 1981.

3.34 Skills of workers in village industry are quite low. The skill is commonly developed from their ancestors in the family or in the village. Attempts to upgrade skills from outsiders such as government agencies have been made but in a very limited extent.

(e) Raw Materials

3.35 Raw materials used vary among village industries. Clay, water reeds, woods, growing naturally in local areas are main raw materials used for brick and pottery making, mat making, ox-cart and wood carving, respectively. Charcoals, which are acquired from woods are used for blacksmithing. Non-glutinous rice, silk yarns and bamboo stems, are used for Thai noodle, silk weaving and bamboo product making, respectively. Cotton yarns and steels, imported from other urban areas, are used for cotton weaving and blacksmithing, respectively. Several of these raw materials such as non-glutinous rice, silk yarns, and bamboo are related to agriculture directly. Even water reeds and woods can be grown on farms.

3.36 Since most of the raw materials used in village industries are primary products acquired from farms or from those growing naturally, ones can expect the relatively small proportions of purchased raw materials used in brick, pottery, mat and bamboo product makings. But the relatively high proportions of purchased raw materials used are found in cotton weaving, blacksmithing, wood carving and ox-cart making.

3.37 Several problems of raw materials used in village industry have been observed. First, shortages of raw materials create the increasing proportion of the purchased inputs. The situation indicates the limitation in local raw material supplies. Secondly, increasing substitution of local raw materials by the imported ones were found in some village industries. Manufactured cotton yarns have completely substituted the native yarns in cotton weaving. Thrown silk yarns have substituted native silk yarns in silk weaving. Plastic fiber and nylon strings have substituted water reeds and kenaf strings in mat making. Third, increasing prices of urban raw materials used in village industry accrue the cost of production, resulting in the decline in net returns to the household. The case was quite obvious in hand tools when the price of steel rose annually about 15–20 percent. All of these problems reduce the ability in competition and potential in the production expansion of village industry. Disappearance of the industry with such a problem may occur as the problem becomes more serious.

Markets and Sales

(a) Sales

3.38 It is believed that a household in a subsistence village favors home manufacturing production. In other words, manufacturing by household is produced for household consumption. The longitudinal survey has found that several types of manufacturing by rural household were produced for market sales. Handtools, ready-made garments, and even bamboo products were mostly produced for market sales. About 98 percent, 95 percent and 80 percent of these products produced in Chiang Mai, Roi Et and Khon Kaen, respectively, were sold to the market. The proportions of products sold vary among industries and locations. Based on the households observed, almost one hundred percent and 94 percent of hand tools produced in Chiang Mai and Roi Et, respectively, were sold, while 88 percent of mats produced in Khon Kaen were sold. But mats produced in Roi Et and Chiang Mai were not sold to the market. For silk weaving about 80 percent of silk fabrics produced in Khon Kaen were sold compared to 14 percent in Roi Et. The findings indicate that most village industries produced goods for market sales. Only in the case of cotton and silk weaving in Roi Et, the poor region in the Northeast, that confirms the expectation that household manufacturing is for subsistence. Again, not all household manufacturing products in this area are produced for household consumption; large

proportions of the production of hand tools, ox-carts, Thai noodles, baskets and sticky-rice containers are sold to the market.

(b) Prices

3.39 Within an industry, prices of the products vary among type and quality and locations. The average price of the high quality patterned silk fabric in Khon Kaen and Roi Et was about ฿500–600 per piece; the low quality silk fabric was about ฿250–300 per piece in Khon Kaen, and ฿300–350 in Roi Et. In Khon Kaen, due to large production volume of low quality silk fabrics and the high competition of patterned cotton fabric whose average prices ranged ฿50–70 per piece, the price of low quality silk fabric was depressed. With the low price of the products, the quantity sold was quite large. In Roi Et, lack of market information among the village producers creates the different pricing behavior of the product.

3.40 Large differences in price by size and by quality were found in mats, whose prices varied from ฿6–80 per piece. Less differences in price by quality but also by size were found in hand tools and pottery. For hand tools, the average price of a large knife for farming was ฿22 compared to ฿15 for a small one. With the same size of the product, less differences in prices of hand tools were found in Chiang Mai and Roi Et.

(c) Markets

3.41 Most products of village industry are produced for local market. Characteristics of the products and the nature of the demand for the products limit the scope of the product markets. Besides the local demand, bricks, pottery, hand tools and ox-carts have high transportation costs. The perishable characteristic of Thai noodles limits its extent of market. Traditional forms and low quality silk and cotton, bamboo product, mats, pottery limit the extent of product market. However, wood crafts, high quality silk and cotton fabric, high quality mats, and modified bamboo products, all these products have broader markets. With the low transportation costs and non-perishability, these products are also sold in the regional and national market. Some of them are in demand of foreign tourists.

3.42 It was observed that production and sales of the products are related to an access to the market or product outlets. The production and sales of silk and cotton fabrics were relatively large in Khon Kaen compared to that in Roi Et. It was found that the parent firms in towns of these products usually provide a subcontracting arrangement for rural households. The parent firms also purchase the products from the villages. Such an arrangement has been little practised in Roi Et. Wood crafts and ready-made garments are other cases of the arrangement practised in Chiang Mai.

3.43 A few outlets of the household manufacturing products were found in all areas studied, particularly in Roi Et. Local middlemen collected products from rural households; but only a few merchants purchased and sold substantially the household manufacturing products. In the case of mats, only 2 merchants in Ban Phai district and 5 merchants in Nampong district are the major outlets in Khon Kaen. The local outlets provided by the government agency and the private agency have not been substantially promoted. The limitation of the product market and the difficulty of market access are the important problems of most household manufacturing products.

3.44 To sum up, the existence and the production expansion of household manufacturing enterprises are associated with several major problems, which are different among industries as shown in Table 3.5. All industries studied, probably except wood carving, have market limitation. Shortages of local raw materials were found in ox-cart making,

Seasonality in Production and Sales

3.45 There is considerable seasonal variation over the course of the year in production, employment and sales of village industries. The pattern of seasonality in production and sales is discussed in this section. The study has found similar patterns of production and sales in most village industries. The production and sales increase during the slack periods of agricultural production, but decrease during the planting and harvesting seasons. Starting from January, the production of manufacturing increases to the peak in March and April, but declines in May when the rainy season begins. The production increases again during the months of September and October when planting activities have been done. Figures 3.1–3.3, as shown illustrate the seasonal variation of employment by industry, which is consistent with the seasonal variation in production and sales.

3.46 The variations of manufacturing production by rural households are associated with 4 major factors: agricultural production, availability of raw materials, the demand for manufacturing products, and weather condition. Agricultural production is related to manufacturing in terms of the increasing demand for labor in agricultural production in the planting and the harvesting season, resulting in the decline in the supply of labor available for manufacturing activities¹ and hence manufacturing production. In the dry season, as agricultural production declines, family labor, particularly female labor usually turn to cotton and silk weaving or household activities.

3.47 The demand for rural manufacturing products usually increased during the dry season. The consumption of silk and cotton, fabrics and Thai noodles increases during the dry season when festivals and rural fairs are usually held. The demand for bricks, cement products, baskets and crop containers made from bamboo strips increases as the first two are used for house construction and farm improvement, and the latter two are used for crops. Cash income of a household usually increases after harvesting season since crop sales are usually made. Transportations and communication in rural areas are also improved during the dry season which facilitate the marketing activities. All of these factors increase the demand for household manufacturing products. Availability of mature bamboo stems by the end of the rainy season through the dry season and water reeds in the rainy season usually increase the production of bamboo products and mat making, respectively in September and October and after the harvesting season. Humidity in the rainy season is not suitable for pottery and brick making, which are made in the rainy season.

3.48 The seasonal variations in production of manufacturing tend to indicate job opportunities in the dry season for rural people rather than a matter of supplementary occupations of farm households. Household members take household manufacturing jobs as the demand for household manufacturing products increases during the dry season; but production declines as the demand for the products declines in the rainy season.

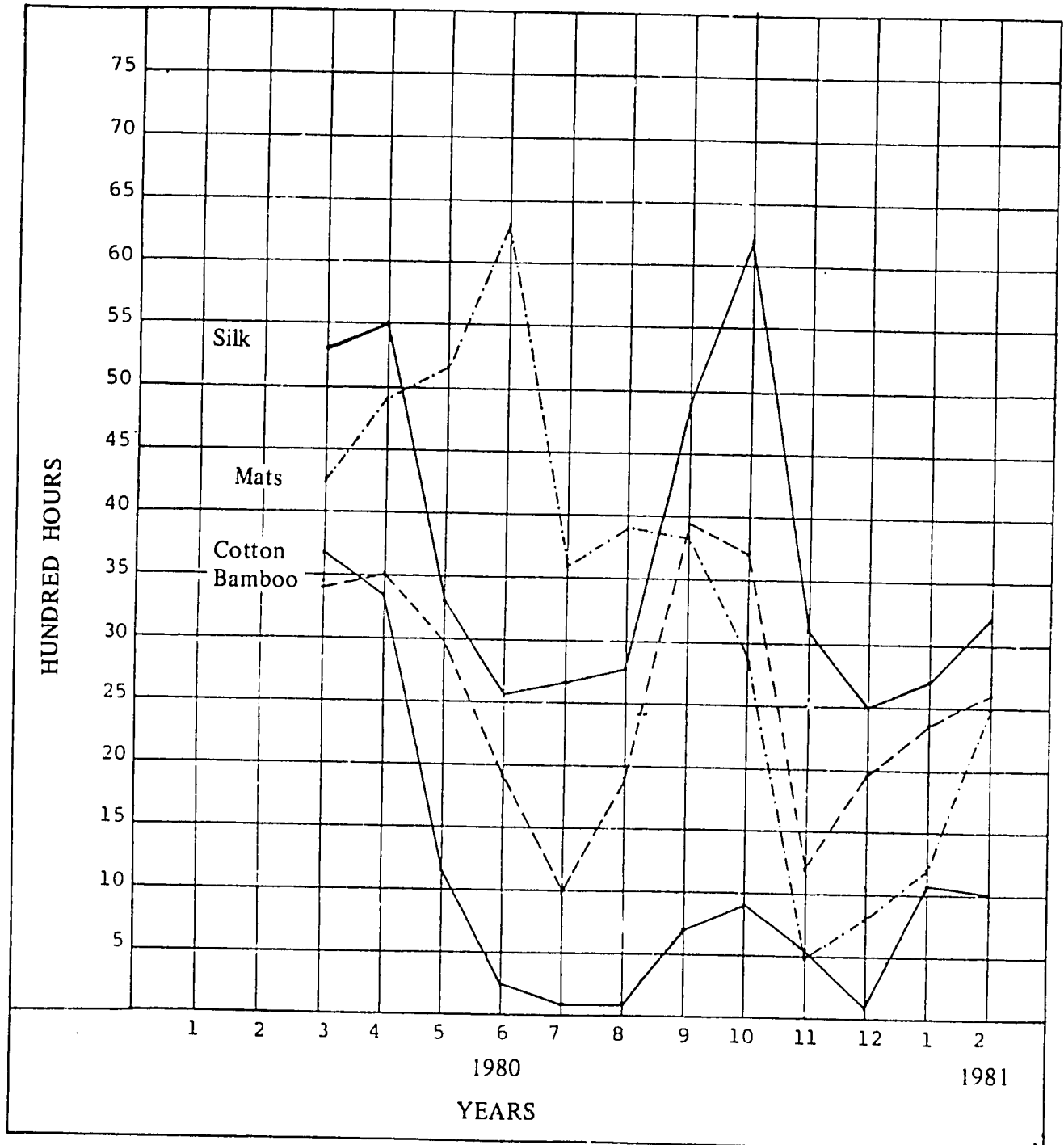
D. ROLES OF VILLAGE INDUSTRY

Employment

3.49 The shares in employment and income of household from manufacturing enterprises are other indicators used to measure their importance and performance of village industry. Starting from the investigation in the role of household manufacturing in employment, Table 3.6 shows the average annual hour worked in the major manufacturing enterprises of households. The data indicate that the average annual hours worked per household varies by province and by enterprise. Among the three

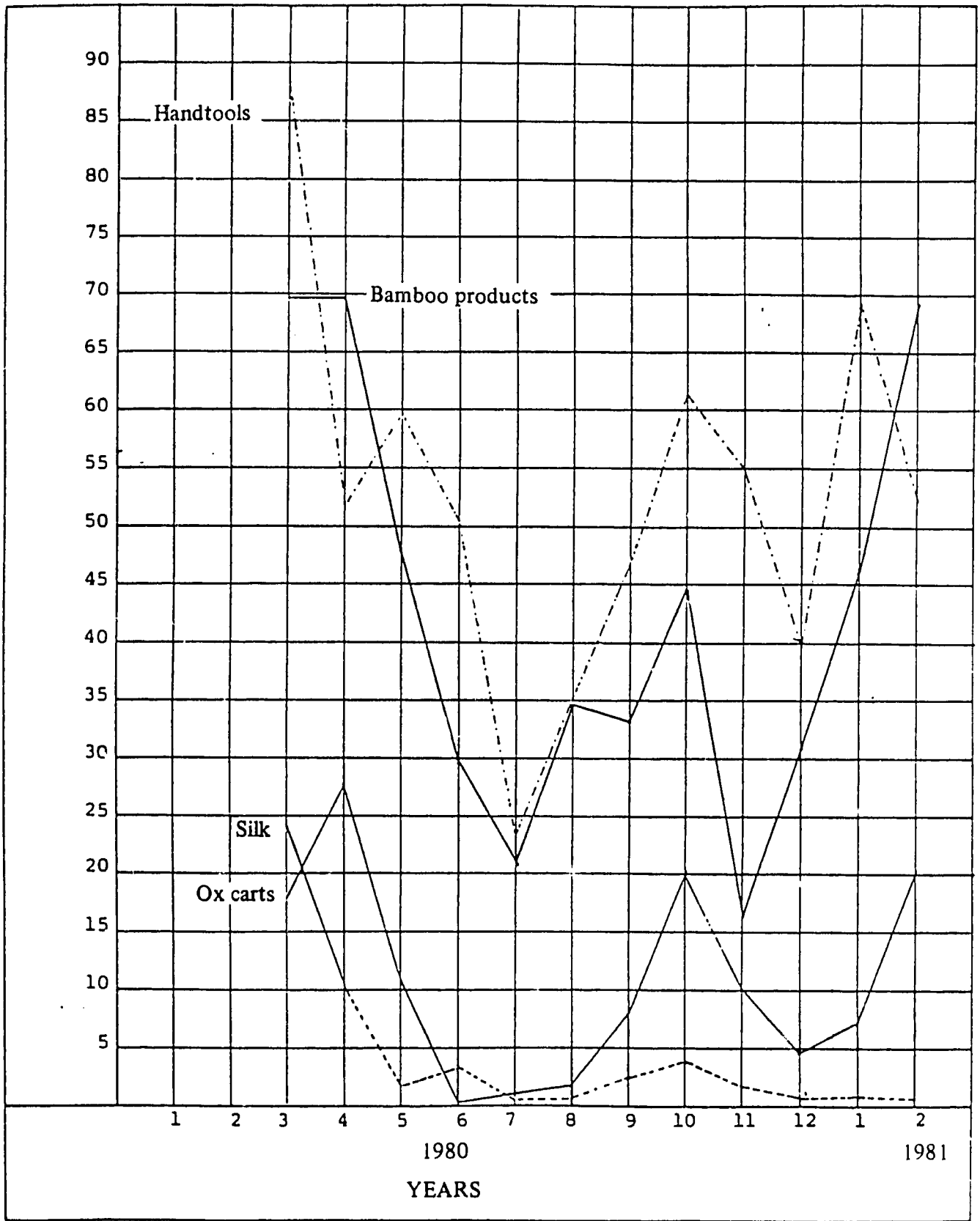
¹ Yongyuth Chalamwong, *Rural Household Labor Supply for Off-Farm Work in Thailand*, Research Paper No. 16 of ROFEAP, Center for Applied Economics Research, Kasetsart University, August, 1982.

Figure 3.1 : KHON KAEN: SEASONALITY IN EMPLOYMENT BY SELECTED INDUSTRIES



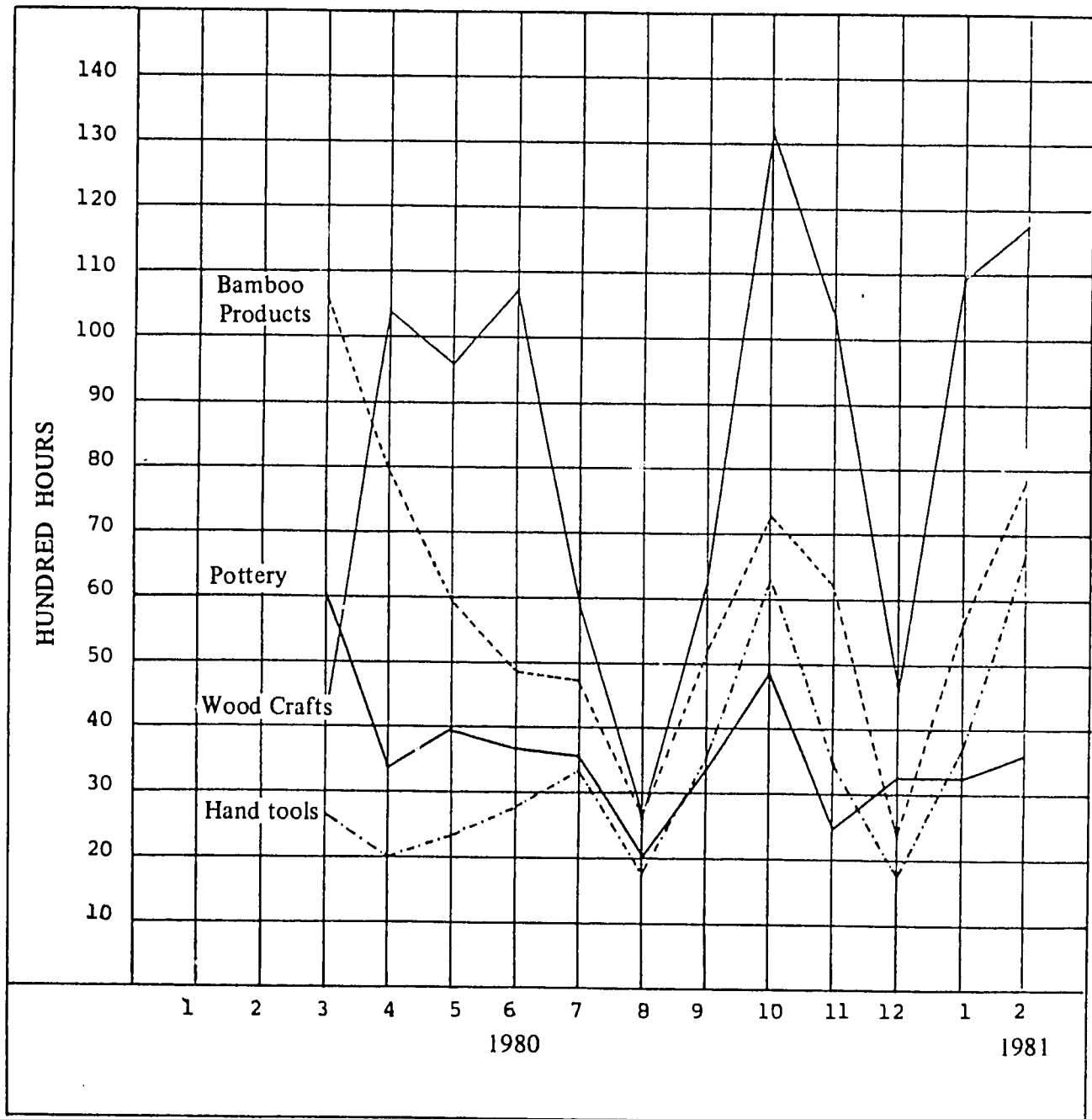
Source: Appendix Table 3.2

Figure 3.2 : ROI ET: SEASONALITY IN EMPLOYMENT BY SELECTED INDUSTRIES



Source: Appendix Table 3.3

Figure 3.3 : CHIANG MAI: SEASONALITY IN EMPLOYMENT BY SELECTED INDUSTRIES



Source: Appendix Table 3.4

Table 3.6 : AVERAGE ANNUAL HOUR WORKED IN MANUFACTURING ENTERPRISES PER HOUSEHOLD BY INDUSTRY IN KHON KAEN, ROI ET AND CHIANG MAI, 1980-81

Major Industry	Hours per Household		
	Khon Kaen	Roi Et	Chiang Mai
Thai Noodles	140	592	2,860
Ox Carts	—	858	—
Silk	588	203	117
Cotton Weaving	193	152	470
Wood Crafts	114	120	2,137
Bamboo Products	479	2,034	1,308
Mats	535	55	53
Pottery	1,562	—	2,987
Bricks	—	—	1,350
Handtools	465	3,237	2,451
All Major Industries	1,115	2,056	2,619

Source: Rural Off-Farm Employment Assessment Project

provinces, the highest average annual hours worked with 2,619 hours in manufacturing per household was found in Chiang Mai. In this province, the hand tools, pottery, wood carving, bricks, bamboo products and Thai noodle, each had more than 1300 hours worked per household over 12 months of 1980/81, indicating the intensity and regularity of production and employment in household manufacturing industries in this area. In Roi Et, the hours worked in the hand tools and bamboo products accrued the average annual hours worked to 2,056 hours per household. In Khon Kaen, only 1,115 hours worked in manufacturing per household was found during the period of 12 months in 1980/81.

3.50 The household manufacturing enterprise's share in the total employment makes clear its importance in the employment of the household. The data in Table 3.7 indicate that in Chiang Mai, Roi Et and Khon Kaen, 43.13 percent, 34.14 percent and 16.73 percent of the households total employment were generated by major household manufacturing enterprises, respectively. The remaining proportion was the shares of agricultural work and off-farm work. In Chiang Mai, four major industries—pottery, Thai noodle, hand tools and wood crafts took the major share in the total household employment; but only pottery was found in Khon Kaen. The relatively high proportions of employment in hand tools and bamboo products were found in Chiang Mai and Roi Et, while that of pottery was found in Chiang Mai and Khon Kaen. The information can be interpreted as follows: 1) Several types of major household manufacturing enterprises can generate substantial shares of employment for rural household in Chiang Mai and Roi Et; 2) Hand tools, pottery, bamboo products, wood crafts and even Thai noodle, each has been operated as a major enterprise of the households in areas studied; 3) In Chiang Mai where a small size of farm land per household and a relatively broad product market exist, the household manufacturing could take a major share in the employment of household.

3.51 It is quite obvious that production and employment in village industry increase during the dry season but decrease in the rainy season. The causes of the variation in seasonality of the production and employment were explained in the previous section. Figures 3.1–3.3 illustrate the pattern of seasonal variations in employment of the village industry which exist in all areas studied. In Chiang

Table 3.7 : PROPORTIONS OF HOUR WORKED IN MANUFACTURING ENTERPRISES TO TOTAL HOUR WORKED OF HOUSEHOLDS BY MAJOR INDUSTRY IN KHON KAEN, ROI ET AND CHIANG MAI, 1980-81

(percent)

Major Industry	Khon Kaen	Roi Et	Chiang Mai
Thai Noodles	2.72	11.25	45.88
Ox Carts	—	19.62	—
Silk	3.57	3.44	1.45
Cotton Weaving	2.75	2.51	6.96
Wood Crafts	1.59	1.93	34.58
Bamboo Products	6.66	30.03	21.45
Mats	6.85	1.19	1.12
Pottery	41.71	—	48.50
Bricks	—	0.57	21.23
Handtools	4.69	48.82	40.85
All Major Industries	16.73	34.14	43.13

Source: Rural Off-Farm Employment Assessment Project

Mai where the intensity of manufacturing enterprises and the relatively high proportion of employment in manufacturing exist, the weekly average hours worked per person in each month over the year were relatively stable compared to that in Khon Kaen and Roi Et.¹ The higher weekly average hours worked of female workers and the lower rates of unemployment of both male and female workers were found in Chiang Mai.² The information can be interpreted that the existence and expansion of production in household manufacturing enterprises can alleviate the seasonal unemployment and underemployment problem and can provide a stability of employment of rural people.

3.52 the intensity and stability of production and employment of manufacturing by households in Chiang Mai are associated with the extent of product market, the subcontracting system, availability of raw materials and skills of labor. For the extent of product market, Chiang Mai is a tourist center in Thailand; not only local consumers but also tourists expand the market. The subcontracting system has been widely practised in manufacturing production. The system can distribute manufacturing work to villagers and reduce the marketing problem of manufacturing products. Abundance of raw materials such as woods for wood carving, bamboo trees for bamboo product making, clay for pottery and brick making, are available in this area. Since manufacturing enterprises have been traditionally practised by the rural people and training and upgrading skills of workers have been made by several organizations, the availability of labor and the relatively high skills of workers for manufacturing exist in these areas. All of these factors increase the intensity of household manufacturing production and employment in Chiang Mai.

¹ Sumala Sirichote, "Employment and Underemployment", *Rural Development Policy of Thailand: Relationship between Farm and Non-Farm Enterprises*, edited by Tongroj Onchan, Pradit Chasombut, Yongyuth Chalamwong, ROFEAP, Kasetsart University, 1982.

² Percentage of employed persons who worked less than 20 hours per week in each month:

Sex	Khon Kaen	Roi Et	Chiang Mai
Male	17.78	20.88	15.15
Female	40.65	41.81	19.16

Income

(a) Household Income

3.53 The data in Table 3.8 indicate that household manufacturing enterprises generate substantial income for rural household, particularly in Chiang Mai. On the average per household, the annual gross income from all major household manufacturings in 1980/81 was ฿24,666 in Chiang Mai, compared to ฿7,877 and ฿3,353 per household in Roi Et and Khon Kaen respectively. By subtracting each expenditures in production from the gross income, the average net income from household manufacturings per household declined by 39 percent, 34 percent and 19 percent in Chiang Mai, Roi Et and Khon Kaen, respectively. The greater declines in the net income from manufacturing production in Chiang Mai and Roi Et were consistent with a larger proportion of the expenditure on purchased inputs to the total cost of household manufacturing production in these provinces.

3.54 It is interesting to note that in Chiang Mai where the intensity of household manufacturing production has existed, the average total net income per household observed in the longitudinal survey was as high as ฿43,550 per annum, compared to ฿31,656 and ฿28,274 in Khon Kaen and Roi Et, respectively.¹ Even the poor region like Roi Et, two village where agricultural production and manufacturing production of household have been substantially practised, the average annual net income per household was ฿50,745 in the village with specialization in sticky-rice container production and ฿31,922 in

Table 3.8 : AVERAGE ANNUAL GROSS INCOME AND NET INCOME FROM MANUFACTURING ENTERPRISES PER HOUSEHOLD BY INDUSTRY IN KHON KAEN, ROI ET AND CHIANG MAI, 1980-81
(Baht/Household)

Major Industry	Khon Kaen		Roi Et		Chiang Mai	
	Gross Income	Net Income	Gross Income	Net Income	Gross Income	Net Income
Thai Noodles	1,572	1,068	9,238	4,895	50,931	19,973
Ox Carts	—	—	9,031	5,973	—	—
Silk	1,963	1,880	802	negative	204	204
Cotton Weaving	171	negative	167	57	519	519
Wood Crafts	384	310	455	450	33,219	22,624
Bamboo Products	914	688	6,195	5,035	6,595	4,298
Mats	1,089	761	80	55	484	242
Pottery	10,985	10,147	—	—	10,662	9,701
Bricks	—	—	—	—	5,015	2,790
Handtools	2,223	2,026	11,067	6,097	9,553	6,748
Average All Industries	3,353	2,722	7,877	5,199	24,666	15,087
No. of Households	134	134	69	69	128	128

Source: Rural Off-Farm Employment Assessment Project

¹ Yongyuth Chalamwong, "Wealth, Income and Credit in Rural Thailand", *Rural Development Policy of Thailand: Relationship between Farm and Non-Farm Enterprises*, op. cit., Table 2, p. 65.

another village with several types of household manufacturing.¹ However, in the village where hand tools production is a main occupation of the households, but farming has been little practised due to shortages of farm land, the lowest average annual income per household was found among all villages studied.

3.55 By industry, wood carvings, and Thai noodle in Chiang Mai generated about twenty thousand baht of the annual net income per households. Pottery could generate about ten thousand baht of annual net income per household.

3.56 The production of household manufacturing enterprise has a major share in the total income of household. In Chiang Mai, the gross and the net income from household manufacturing enterprises accounted for 52.5 and 45.5 percent of the total household income, respectively. In Roi Et, the manufacturing income shared about 22.4 percent of the total net household income compared to only 7.6 percent in Khon Kaen. Based on the household manufacturing share in the total household income in Chiang Mai, ones may believe that the household manufacturing enterprise can be operated as a main occupation of household. Even in Roi Et and Khon Kaen, the development of household manufacturing may increase the household income. (See Table 3.9)

Table 3.9 : PROPORTIONS OF GROSS INCOME AND NET INCOME FROM MANUFACTURING ENTERPRISES TO TOTAL GROSS INCOME AND TOTAL NET INCOME OF HOUSEHOLD BY INDUSTRY IN KHON KAEN, ROI ET AND CHIANG MAI, 1980-81

(percent)

Major Industry	Khon Kaen		Roi Et		Chiang Mai	
	Gross Income	Net Income	Gross Income	Net Income	Gross Income	Net Income
Thai Noodles	3.82	3.73	35.14	22.10	47.67	57.94
Ox Carts	—	—	21.88	24.63	—	—
Silk	4.25	4.03	0.28	-0.03	1.19	1.24
Cotton Weaving	0.41	-0.38	0.37	0.26	2.06	2.74
Wood Crafts	0.91	1.04	1.46	2.04	61.63	52.76
Bamboo Products	2.86	2.39	24.56	18.67	12.10	12.98
Mats	2.48	2.12	0.32	0.15	1.34	0.85
Pottery	51.24	65.87	—	—	42.28	34.55
Bricks	—	—	—	—	14.91	11.16
Handtools	3.15	5.19	61.43	49.21	24.10	25.18
All Major Industries	6.20	7.57	27.82	22.41	52.53	45.54

Source: Rural Off-Farm Employment Assessment Project

¹ Yongyuth Chalamwong, "Wealth, Income and Credit in Rural Thailand"; *Rural Development Policy of Thailand: Relationship between Farm and Non-Farm Enterprises*, op. cit., Tables 1 - 3, pp. 64 - 66.

(b) Returns to Labor

3.57 The returns to labor which are measured in terms of the average annual net income per hour are shown in Table 3.10. The returns to labor vary among industries and among provinces. Among three provinces, the net income per hour in manufacturing production was the highest in Chiang Mai. On the average the household manufacturing production in Chiang Mai can generate B46 per 8 hour-working day, compared to B32 and B20 in Khon Kaen and Roi Et, respectively. The high net returns to labor in Chiang Mai are associated with types of industry, quality of the products and the extent of product market.

3.58 By industry, it is surprising that the net returns to labor from Thai noodle are as high as B7-8 per hour. Thus the 8 hour-working day, in Thai noodle production could generate earnings of B56-64 in 1980/81. Wood carving in Chiang Mai, ox-carts in Roi Et, and pottery in Khon Kaen also generated the relatively high net returns to labor. The production of these industries require skills of workers which can increase the value of labor productivity. Since the production of ox-carts in Roi Et and pottery in Khon Kaen exists in the remote areas, the subsistence oriented economy and less competition from outsiders tend to favor the household manufacturing in the villages.

3.59 The majority of village industries—hand tools, bricks, pottery in Chiang Mai silk weaving in Khon Kaen, wood carving in Roi Et and Khon Kaen, could generate about B15-35 of net returns to an 8 hour-working day. The earnings were not much different from the local wage paid, which ranged from B20-25 per day in 1980-1981. Only cotton weaving, mat making, silk weaving in Roi Et and Chiang Mai, and Bamboo products in Khon Kaen, have very low net returns to labor.

Table 3.10 : AVERAGE ANNUAL GROSS INCOME AND NET INCOME FROM MANUFACTURING ENTERPRISES PER HOUR WORKED BY INDUSTRY IN KHON KAEN, ROI ET AND CHIANG MAI, 1980-81

(Baht/Household)

Major Industry	Khon Kaen		Roi Et		Chiang Mai	
	Gross Income	Net Income	Gross Income	Net Income	Gross Income	Net Income
Thai Noodles	11.21	7.68	15.62	8.28	17.81	6.98
Ox Carts	—	—	10.53	6.96	—	—
Silk	3.34	2.85	0.40	-0.04	1.75	1.75
Cotton Weaving	0.89	-0.59	1.09	0.37	1.10	1.10
Wood Crafts	2.72	2.67	3.80	3.77	15.54	10.56
Bamboo Products	1.91	1.44	3.05	2.48	5.04	3.29
Mats	2.04	1.42	1.45	1.01	9.12	4.57
Pottery	7.03	6.50	—	—	3.56	3.24
Bricks	—	—	—	—	3.72	2.07
Handtools	4.78	4.36	3.42	1.88	3.89	2.75
Average All Industries	4.56	3.98	3.38	2.53	9.42	5.73

Source: Rural Off-Farm Employment Assessment Project

3.60 Within an industry, the variations in the net returns to labor were found among regions, types and quality of products. For example, the average net returns to labor in silk fabric production was $\text{฿}2.85$ per hour in Khon Kaen compared to $\text{฿}1.75$ and a negative value in Chiang Mai and Roi Et, respectively. The relatively high quality of silk fabric as has been explained in the production section can generate higher returns for silk fabric making in Khon Kaen. For wood carving and bamboo products, differences in kind and quality of products create the differences in the net returns to labor. On the other hand, Thai noodle of which the nature of product is similar, generate very close net returns to labor among all areas studied.

3.61 Regarding the data of earnings in Table 3.8 and 3.10 one has to realize the possible bias from the small size of households observed in some industries. For example, the sample size of 5 households in the case of Thai noodle production in Roi Et and Khon Kaen and 6 and 8 households of mat makings in Roi Et and Chiang Mai, respectively, may generate suspicious results in the average net returns to labor. Even the cotton weaving of which the negative average net returns to labor were found among the households observed in Khon Kaen two baht per hour of net returns to labor were found in the villages with specialization in cotton weaving. Incidentally, such a village was not included in the longitudinal survey.

3.62 To sum up, among the 10 types of household manufacturing enterprises, only traditional cotton and silk weaving, mat making and bamboo product making, have very low net earnings to labor. Other types of manufacturing could generate reasonable net earnings at least $\text{฿}20$ per 8 hour-working day. The high net returns to labor in Thai noodle, wood carving, pottery and some other household manufacturing stimulate rural household to be engaged in these types manufacturing as a main occupation of the household. One may wonder that why production expansions of some household manufacturing enterprises such as Thai noodle, ox-carts or wood carving were not found in some areas if they can generate the very substantial income. The shortages of raw materials, skills requirements, characteristics of products and marketing problems as have been discussed in the previous sections are the major constraints of the production expansion. For example, the perishable characteristic and the limited extent of local market are the main problems of Thai noodle production. Wood shortages and skill requirements are the major problems in wood carving.

E. RELATIONSHIPS OF HOUSEHOLD MANUFACTURING, AGRICULTURE AND OFF – FARM WORK

3.63 The discussion in the previous sections indicates that the existence and growth of household manufacturing enterprises are associated with the availability of raw materials, local markets and the extent of markets, and local labor and skills of workers. In terms of linkages, the household manufacturing enterprise has close relationship with agriculture. First, most inputs used in household manufacturing production come from agricultural products and forest products. Second, the labor used in household manufacturing enterprises come from the farm household labor force. As agricultural production declines in the dry season, the supply of labor for manufacturing increases. Increases in the household manufacturing production during the dry season reduce the seasonal unemployment and out-migration rates in rural areas. Third, agricultural production also increases the demand for household manufacturing products. Sales of hand tools and baskets usually increase during the periods prior to the planting season and the post harvesting season. Ox-carts are used for transportation of agricultural products in remote areas. Fourth, savings from agriculture are often used for household manufacturing investment. On the other hand, sales of household manufacturing products provide cash income for rural households.

3.64 The household manufacturing enterprises also have relationships with off-farm work and other types of production. First, household manufacturing production is a source of demand for the urban manufacturing products. Cotton and silk weaving requires cotton yarns and thrown silk, dyestuffs for the fabric production, while steels are used for hand tools production. Second, the household with experiences in manufacturing production can supply the labor force for small scale industries in towns. Most of the workers who work in silk weaving plants and ready-made garments in towns had skills developed from their families. Third, the marketing activities such as collecting, processing and sales of products usually occur as the household manufacturing production expands. Such an activity indicates the linkage between the household manufacturing enterprises with production and employment in other industries. Fourth, household manufacturing products can be used as inputs for the production in other industries. High quality mats are used for hand bags making. Silk and cotton fabrics are used for shirts, dress, purses and other household uses. The relationships indicate the backward and forward linkages of household manufacturing with agriculture and off-farm work.

F. POLICY IMPLICATIONS

3.65 In terms of unemployment problem, the data from the labor force survey indicate that about 3-4 million people wait for agricultural work during the dry season.¹ Some of them are active job seekers. The situation is quite serious in the rainfed areas, particularly in the Northeast. Based on the results of the study, it is quite obvious that village industry can alleviate the seasonal unemployment among the rural people. Production expansion in village industry is one of the strategies in coping with the seasonal unemployment in rural areas and in providing alternative job opportunities for the rural people.

3.66 In terms of income, several types of household manufacturing production can generate relatively high net returns to labor and provide substantial income to the rural households. To increase income and employment of the rural people, production of village industry should be promoted.

3.67 Since potentials vary among industries, only those with some potentials for production expansion and income generation should be promoted. For some industries like ox-carts and pottery, the expected demand for their products may decline as the economy develops. Though the net returns to labor are relatively high under the present condition, the production expansion of these industries should not be promoted. Silk and cotton weaving, bamboo product and mat making, all have less potential for income generation due to the relatively low returns to labor, but they have good potential for employment generation, particularly among rural female workers. However, the high quality silk fabric and cotton fabric, and mats as well as the developed bamboo products can generate higher earnings to labor. The high quality silk fabric and cotton fabric are in the demand of the high income people. Thus quality improvement and market expansion will increase the potential for higher income generation. The increase in the supply of woods for wood carving tends to increase the potential for income and employment generation in wood crafts. Bricks and cement products have good potentials due to the increasing demand for construction and the decreasing supply of woods. Thai noodles seem to have better potential for income and employment generation due to the high net returns to labor and the expected increasing consumption of this product. However, its perishable characteristic limits the extent of product market and large scale production.

3.68 For product development, modifications of products and quality differentiation should be promoted. Various products with modifications of forms, design and quality should be produced for the market. Production expansion of the high quality silk fabric and cotton fabric should be promoted

¹ National Statistical Office, *Report of the Labor Force Survey, Whole Kingdom (round 1) 1977-1981*

for urban markets. The high quality mats should be developed for hand bag making or for other purposes.

3.69 To improve the product quality first, upgrading of skills of workers and development of technology used must be promoted. Trainings of skills and introduction of innovations could be made through the services of a local industrial center. This implies that the extension workers and industrial extension center must be provided. Increasing budget for the extension services must be supplemented. Second, the raw material development in terms of quantity and quality is necessary, particularly woods for wood carving and native silk yarns for silk fabric production. This implies that the policy on agricultural production should support the household manufacturing enterprises.

3.70 Market development is a very important policy for village industry, since most household manufacturing enterprises have faced with limited markets and product outlets. The policy should put the emphasis on relationships of the producers in towns and rural households by a subcontracting system. The systems provides not only the outlets for the household manufactured products but also market information and technology transfers from the town producers. To promote the subcontracting system between the town producers and rural households, the tax policy should be considered. The low rates of taxation on subcontracting work will be an incentive for town producers to have the subcontract arrangements. Provisions of infrastructure such as roads will facilitate the subcontract work. In the areas where a subcontract arrangements cannot be made by town producers, the center of product outlets should be arranged at the provincial or local levels. The provincial centers should have connections with the outlets in Bangkok. The foreign markets of the household manufacturing products should be promoted. In the domestic market, the consumption promotion of the household manufacturing products, particularly among the high income people should be promoted.

G. PROGRAMS FOR THE VILLAGE INDUSTRY DEVELOPMENT

3.71 The programs for marketing assistance and the production assistance should be developed. For the marketing assistance, the promotion of subcontracting arrangements between town producers and rural household producers should be promoted in the areas where the potential subcontracting work exists. The program aims to increase the roles of private sector in the household manufacturing development. The government themselves should provide marketing assistance at the provincial level where subcontracting arrangements are not available. The provincial center provides the outlets for the household manufacturing products as well as raw materials for local producers. Operating funds for the program should be provided for the center. The provincial centers should have connection with the Bangkok center or Bangkok wholesalers as well as exporters. Moreover, campaign for domestic consumption of the household manufacturing products should be made regularly and local fairs of the household manufacturing products should be financially supported by local government in each year.

3.72 For production assistance, the extension service center should be set up at the regional and provincial levels. The technical assistance and skill development should be delivered by the extension workers through a group of village producers. That means a producer group should be promoted on the specialization basis. The subcontracting work may be provided to the group of producers. To support the policy on raw material production the development program of crops production for industrial inputs used and raw material development must be carried out by the Ministry of Agriculture and Cooperatives and the provincial government. The details of the development programs by activity, location and means are listed in Table 3.11.

Table 3.11 : A LIST OF THE PROGRAMS FOR HOUSEHOLD MANUFACTURING DEVELOPMENT

<u>Activities</u>	<u>Industry</u>	<u>Location</u>	<u>Means</u>
1. Subcontracting work	<ul style="list-style-type: none"> - silk weaving - cotton weaving, - ready-made garments, - bamboo products - mats - handtools - fish nets - wood crafts 	<ul style="list-style-type: none"> - the north, - the northeast - central plain 	<ol style="list-style-type: none"> 1. taxation incentives; 2. high minimum wages in towns; 3. Provisions of transportation and communication; 4. Promotion of village producer concentration; 5. Asks for cooperation from town producers;
2. Provincial market center assistance	all products in household manufacturing	in the province where the substantial outlets for products do not exist	<ol style="list-style-type: none"> 1. promoted by the provincial government; 2. provision of the budgets for products purchases;
3. Extension service center	all village industries	in the location where raw materials or other resources are available	Provision services in <ul style="list-style-type: none"> - technology development, - skills development, - product development, - through the extension workers and DIP;
4. Promotion grouping of village producers	All industries particularly <ul style="list-style-type: none"> - silk and cotton weaving - mat making - bamboo products - hand tools - wood carving 	in the village where skills or raw materials are available	<ol style="list-style-type: none"> 1. Promotion the division of labor; 2. Promotion specialization of labor; 3. promotion a group leader in villages.
5. Up-grading skills of workers	All industries particularly, <ul style="list-style-type: none"> - wood carving - hand tools - silk weaving - cotton weaving 	All areas particularly in the northeast	<ol style="list-style-type: none"> 1. Training in short courses by local labor institute and outschool programs; 2. on the job training;
6. Raw material development	woods, silk yarn, bamboo trees, water reeds, clay for pottery & brick,	in the north and the northeast	<ol style="list-style-type: none"> 1. relaxation of forest regulation; 2. development of woods for wood carving; 3. increases in production of native silk yarns; 4. promotion of bamboo trees, water reeds growing;
7. Technology and tools development	All industries particularly <ul style="list-style-type: none"> - silk & cotton weaving - bamboo products - mats - pottery - bricks - handtools 	All areas	<ol style="list-style-type: none"> 1. researches and development of traditional tools by local vocational school and universities; 2. budget provision for research and experiment.

Appendix Table 3.1 : DISTRIBUTION OF HOUSEHOLDS BY AREA AND TYPE, BY REGION, THAILAND, 1975-76

(percent)

SES 1975/76 Region	Municipal Area	Sanitary Districts		Villages		% of Region in Total
		Farm ^a	Non-farm	Farm	Non-farm	
North-Upper	7.4	11.1 (3.3) ^b	4.6	64.5 (14.8) ^b	12.3	12.1
North-Lower	7.3	3.9 (1.2)	3.6	71.7 (8.0)	13.4	10.9
Northeast-Upper	4.4	5.1 (.9)	5.7	78.3 (10.1)	6.5	16.1
Northeast-Lower	6.3	4.2 (.8)	5.2	74.0 (8.7)	10.4	16.4
Center-West	8.0	10.6 (3.2)	7.1	61.5 (10.5)	12.7	5.4
Center-Middle	8.8	13.9 (3.9)	10.5	52.7 (10.6)	14.0	8.3
Center-East	7.6	3.7 (.7)	1.9	55.4 (9.5)	31.2	5.7
South-Upper	11.2	6.4 (1.8)	5.7	62.6 (18.3)	14.0	9.7
South-Lower	19.7	3.3 (1.3)	2.0	62.7 (21.0)	12.3	3.0
Greater Bangkok	65.4	4.3 (.6)	9.3	8.7 (1.6)	12.3	12.4
Whole Kingdom	14.8	6.5 (1.6)	5.8	60.3 (10.4)	12.6	100.0

^a A farm household is one which has an agricultural enterprise. Unlike the definition of an agricultural household used in earlier work, that of a farm household would include one with an agricultural enterprise whose head is not in the agricultural sector but exclude one without an agricultural enterprise whose head works in the agricultural sector.

^b Figures in parentheses represent percentages of households with agricultural enterprises but whose heads are not in the agricultural sector.

Source: Data tapes of the Socio-Economic Survey, 1975/76, National Statistical Office; compiled by a joint Thai-World Bank team in Growth and Employment in Rural Thailand, op.cit., Table 2.6, p. 36

Appendix Table 3.2 : KHON KAEN : MONTHLY HOUR WORKED IN MANUFACTURING ENTERPRISES OF HOUSEHOLDS OBSERVED IN 1980-81.

Month	Thai Noodles	Silk	Cotton Weaving	Carpentry	Bamboo Products	Mats	Pottery	Hand tools
Mar. 1980	258	5,333	3,682	1,169	3,471	4,254	2,169	361
Apr.	29	5,502	3,351	1,480	3,538	4,939	1,434	391
May	107	3,331	1,151	472	3,031	5,179	1,120	163
June	74	2,579	245	270	1,893	6,328	540	233
July	24	2,672	96	120	1,042	3,600	810	36
Aug.	72	2,772	100	375	1,964	3,907	1,065	409
Sept.	30	4,916	693	68	3,978	3,796	831	345
Oct.	61	6,227	937	120	3,753	2,929	610	345
Nov.	—	3,157	584	—	1,237	534	705	25
Dec.	—	2,538	83	18	1,967	813	1,783	206
Jan. 1981	15	2,725	1,087	226	2,372	1,182	1,690	358
Feb.	20	3,204	1,039	228	2,610	2,543	1,489	386
Total	690	44,956	15,128	4,546	30,804	40,004	14,255	3,258

Source: Rural Off-Farm Employment Assessment Project

Appendix Table 3.3 : ROI ET: MONTHLY HOUR WORKED IN MANUFACTURING ENTERPRISES OF THE HOUSEHOLDS OBSERVED IN 1980-81.

Month	Thai Noodles	Ox Carts	Silk	Cotton Weaving	Carpentry	Bamboo Products	Mats	Hand Tools
Mar. 1980	304	1,798	2,417	1,808	1,640	6,941	4	8,848
Apr.	210	2,758	1,012	2,001	1,144	6,942	—	5,143
May	420	1,082	191	937	469	4,727	—	5,956
June	77	44	333	241	34	2,929	—	5,068
July	—	—	57	—	115	2,101	—	2,324
Aug.	—	168	59	—	108	3,429	42	3,466
Sept.	40	791	230	—	25	3,395	30	4,662
Oct.	—	1,987	386	—	48	4,471	232	6,136
Nov.	—	1,001	159	—	19	1,602	—	5,449
Dec.	—	474	63	—	187	3,159	—	3,928
Jan. 1981	90	716	279	190	10	4,632	27	6,909
Feb.	—	2,021	55	228	260	6,901	—	5,222
Total	1,141	12,840	5,241	5,511	4,059	50,419	329	63,111

Source: Rural Off-Farm Employment Assessment Project

Appendix Table 3.4 : CHIANG MAI : MONTHLY HOUR WORKED IN MANUFACTURING ENTERPRISES OF THE HOUSEHOLDS OBSERVED IN 1980-81.

Month	Thai Noodles	Silk	Cotton Weaving	Wood Crafts	Bamboo Products	Mats	Pottery	Bricks	Hand Tools
Mar. 1980	3,872	81	599	4,096	10,599	—	6,018	2,873	2,674
Apr.	4,362	—	1,174	10,394	7,937	348	3,365	3,257	2,022
May	4,092	55	1,236	9,565	5,929	—	3,934	2,214	2,346
June	3,636	630	469	10,717	4,834	—	3,668	1,789	2,780
July	3,650	56	111	5,837	4,709	—	3,567	1,825	3,308
Aug.	2,797	—	—	2,669	2,691	—	2,028	1,024	1,792
Sept.	3,369	112	463	6,295	5,219	—	3,373	1,564	3,519
Oct.	4,944	—	1,151	13,186	7,297	36	4,883	4,124	6,296
Nov.	3,815	—	862	10,388	6,201	42	2,479	5,389	3,448
Dec.	3,352	—	49	4,598	2,353	—	3,274	1,734	1,777
Jan. 1981	4,017	—	446	10,974	6,639	—	3,274	1,700	3,684
Feb.	3,854	21	1,026	11,729	7,808	—	3,626	3,169	6,683
Total	45,760	955	7,597	100,448	72,274	426	42,237	30,662	40,335

Source: Rural Off-Farm Employment Assessment Project

Chapter 4

Town Industry

by

Somsak Tambunlertchai

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TOWN INDUSTRY

A. INTRODUCTION

4.1 Manufacturing output and employment in Thailand have expanded at a high rates over the past two decades. Industrial activities are however highly concentrated in Bangkok and its surrounding provinces in the Central region.¹ The concentration of industrial activities has created several social and economic problems including uneven income distribution among regions, congestion and pollution in Bangkok and nearby provinces. Since the early 1970s, the government aware of the imbalance of industrial growth has attempted to disperse industrial investment to other regions, but without any success.

4.2 There are several reasons for the clustering of industrial factories in and around Bangkok. Important among these are the closeness to the biggest consumer market, the availability of modern facilities for both production and living conditions. For industries that use imported inputs, the location near the port of entry in Bangkok can save a great deal of transportation expenses. Even for industries that do not rely mainly on imported inputs the availability of a wide variety of production facilities and productive services, including skilled work force and ancillary services in the cities also serve to facilitate their production. It is well known that despite rapid economic growth in Thailand, there is still a severe lack of infrastructural facilities for industrial development such as electricity, water supply and communication system in rural areas and provincial towns. This has seriously hindered the successfulness of the attempt made for industrial decentralization. The industrial development strategy since 1960 which has given high incentives to modern consumer goods industries has also contributed to the concentration of industrial location, as industries created tend to locate near the principal port and the principal consumer market in Bangkok.

4.3 Notwithstanding the heavy geographical concentration of industrial location, there exists a wide variety of industrial activities that are mainly located in rural areas and provincial towns. The existence and growth of rural industries² can contribute much to income and employment generation in provincial areas, and can also contribute toward the alleviation of over congestion of industrial activities in the Bangkok metropolis and its surrounding provinces. It is thus interesting to look into the characteristics and growth potential of the provincial industries, as well as problems encountered by them, and identify the factors which foster or hinder the growth potential of these industries, so that policy implications can be drawn to assist the attempt of promoting industrial growth in provincial areas.

4.4 The Rural Off-Farm Employment Assessment Project (ROFEAP) surveys 14 types of industries both in villages and in provincial towns. There are also a number of studies made on broad issues concerning the operation of rural industries, such as those on finance, marketing, entrepreneurship, and

¹ In 1980, the minimum wage for the North and Northeast provinces is B44 a day. It should be noted that even in Bangkok, small and medium scale industrial enterprises also tend to pay wages lower than the legal minimum wage.

² In this Chapter, "rural industries" mean those industries which are located in rural villages and in provincial towns, including those in the provincial capitals other than Bangkok and the provinces nearby Bangkok (which include Samutprakarn, Patumtani, Samutsakorn, Nontaburi, and Chonburi).

management. Although the survey for town industries¹ is made in only 11 towns in 4 provinces listed in Table 4.1 and focused in only a narrow range of products, it generates substantial data and provide much useful information on rural industries which has virtually never been gathered before in Thailand.

4.5 In this chapter, we will summarize the major findings obtained from the ROFEAP survey of town-based industrial activities, and try to draw some conclusions as well as policy implications from the findings. The ROFEAP team made surveys in 14 industries, 8 of which were town-based industries. There are however some overlapping between town and village industries, as some products are produced both in towns and village producers are surveyed and the results are reported in the same industry study. The discussion in this chapter while focused mainly on the town-based industries, will unavoidably touch upon certain issues concerning village industries as well.

B. AN OVERVIEW OF TOWN-BASED INDUSTRIAL ACTIVITIES

4.6 Industrial activities located in provincial town are by no means homogeneous. They produce different types of products; use different materials and production techniques; and serve different markets. We can, however, find certain common characteristics among the seemingly diversified industrial activities. Industrial activities found in provincial towns are mostly small in scale; they produce simple household products to serve mainly the local market; and use relatively simple techniques of

Table 4.1 : ROFEAP PROJECT RESEARCH AREAS

Region	Province	District
North	Chiang Mai	1. Chiang Mai (Muang) ^a 2. San Kamphaeng 3. San Pa Tong
Northeast	Khon Kaen	1. Khon Kaen (Muang) 2. Ban Phai 3. Chonnabot 4. Nam Phong
	Roi Et	1. Roi Et (Muang) 2. Chaturaphak Phiman
Central	Suphan Buri	1. Suphan Buri (Muang) 2. Don Chedi

^aMuang means city or municipality.

Source: Donald C. Mead and Richard L. Meyer, *Rural Off-Farm Employment Surveys: Approaches and Methodology*, Research Paper No. 3 of ROFEAP, Center for Applied Economics Research, Kasetsart University, May, 1981.

¹Town industries in ROFEAP survey are made on industrial establishments located within the municipality or sanitary district boundary. Except in the city of Chiang Mai, where the survey also cover industrial establishments up to 5 kilometre outside the municipal boundary along each of the main roads leading out from the city.

production; they also have a close link with the agricultural sector, either in terms of securing agricultural resources from nearby villages as raw materials, hiring workers from the villages, or selling products to villagers around the town where the firms are located. The orientation towards or the dependence on markets and raw materials is different from one type of industry to another. But we can say that the survival of many town industries depends much on various aspects of the rural economy.

4.7 While we call both town and village industries as rural industries, we should note that there are distinctive differences in their characteristics. Industrial enterprises in town can more properly be called “factories” where workers are hired and they mostly engage in year round production, although production level may be low in certain period of the year due to the lack of raw materials or labor. Village industries with few exceptions are home industries operated by farm households. It is a type of non-farm activity¹ usually secondary to agriculture by which farm households engage to augment their income. Manufacturing activities in villages are low or non-existent during the peak agricultural season. The products manufactured by town and village industries are often quite different. Town industries are in general more market-oriented, their products tend to serve a wider market, although many of the products also use intensively agricultural output as raw materials. Products produced in village households, on the other hand, are either resource-oriented products consumed locally, such as mats, baskets and other bamboo products, or those require some specific skills, such as pottery and agricultural hand tools. Even the same type of product which is produced both in town and in village, the techniques of production could be quite different. Town industries are relatively more mechanized or capital intensive. Needless to say, town enterprises are better financed and have better access to various types of facilities compared to village households.

Town Industry Covered in the ROFEAP Survey

4.8 There are 8 types of town industry that are studied by the ROFEAP team. These include bricks, cement products, furniture, wood carving, food and vegetable processing, ready-made garments, noodles and soybean curds.² A total of 147 firms are comprehensively surveyed. The criteria for the selection of industries under study are that they are widely available in the surveyed towns, they are either closely linked with the village economy, or are having good growth potential. The sample firms are selected such that they will reflect a diversity of firm size, product type, production technology, and location.³ Table 4.2 shows the distribution of firms in town survey by product type and location. Most of the firms covered in the town survey are small scale and only 8 out of the 147 firms are with more than 50 employees.

4.9 Although the survey on town industry was intended to be made in 11 towns in 4 provinces in Central, North and Northeast as shown in Table 4.1, the actual industry studies have been concentrated in only 7 towns in 3 provinces. (see Table 4.2). The ‘pre-town’ survey in Phase I, which tried to enumerate all industrial enterprises in the areas under study, however, did cover all 11 towns in 4 provinces. The two provinces in the Northeast region are chosen⁴ because Northeast is the poorest region of the

¹ “Non-farm” activity in ROFEAP means activities other than agricultural work, either done in the village or elsewhere. “Off-farm” activity, on the other hand, refers to production or employment which takes place outside the land owned or rented by the farm household under consideration. See Donald C. Mead and Richard L. Meyer, *Rural Off-Farm Employment Surveys: Approaches and Methodology*, op.cit., pp. 2–3.

² Noodles and Soybean curds are considered as one industry in ROFEAP

³ Donald C. Mead and Richard L. Meyer, *Rural Off-farm Employment Surveys: Approaches and Methodology*, op.cit., pp. 36–37.

⁴ Donald C. Mead and Richard L. Meyer, *Rural Off-Farm Employment Surveys: Approaches and Methodology*, *Ibid.*, page 5.

Table 4.2 : FIRMS IN TOWN SURVEY SAMPLE, BY LOCATION

	Chiang Mai			Khon Kaen			Roi Et	Total
	Muang	San Kamphaeng	San Pa Tong	Muang	Ban Phai	Chonabot	Muang	
1. Bricks	3	—	—	—	—	—	—	3
2. Cement products	9	—	2	3	2	—	3	19
3. Fruit & Vegetable processing	8	—	—	—	—	—	—	8
4. Furniture	8	—	—	5	3	—	3	19
5. Ready-made garments	10	14	—	4	1	—	—	29
6a. Noodles	4	—	—	3	2	—	5	14
6b. Bean curds	4	—	—	3	1	—	1	9
7. Silk	—	—	—	—	6	29	—	35
8. Wood crafts	8	3	—	—	—	—	—	11
Total	54	17	2	18	15	29	12	147

Source: Donald C. Mead and Richard L. Meyer, *Rural Off-Farm Employment Surveys: Approaches and Methodology*, op.cit., Table 6

country and the problem of underemployment is serious. Roi Et is among the poorest provinces in the region, and Khon Kaen is a big province in the region with a variety of non-farm activities. The Northern province of Chiang Mai is selected for the existence of well-developed rural non-farm enterprises in this province, so that research in Chiang Mai "should provide insights into the type of non-farm activities which may be feasible in other regions. Problems and constraints of on-going activities can also be studied in this region".¹ And finally, the Central province of Suphan Buri is chosen because of its well-developed agricultural production, which may provide insights into the nature of non-farm activities in areas with intensive multiple cropping pattern. There are also additional criteria for the selection of location, including the representativeness of the location's dominant cropping system and major non-farm enterprises, accessibility to the survey staff of Kasetsart, Chiang Mai, and Khon Kaen Universities, availability of previous studies in the areas, and being the target areas of USAID and other donor agencies.

4.10 The ROFEAP team made an enumeration of enterprises both in towns and villages during Phase I of the research project. It is found that there exists a variety of industrial enterprises in the surveyed towns. Textile products including garments are the most important category in terms of number of firms and employment. Repair shops including vehicle repair, mechanical and electrical repair shops are also numerous. Other important industries found are wood and bamboo products, and various types of food and processed agricultural products. There have been findings of specialized patterns of manufacturing activities in different towns. For example, in San Pa Tong and San Kamphaeng of Chiang Mai, most of the industrial enterprises are in textiles (knitting in San Pa Tong and garments in San Kamphaeng). In Chonabot of Khon Kaen, over 95 percent of industrial workers are engaged in silk making, and in Nam Phong, about two-thirds of the workers are engaged in mat making. In the two towns of Suphan Buri, a concentration of industrial employment in the processing of agricultural products and repair services (including repair of tractors and other agricultural implements) has been found.

¹ See Donald C. Mead and Richard L. Meyer, *Rural Off-Farm Employment Surveys: Approaches and Methodology*, op.cit., page 5.

4.11 It is interesting to note that the data obtained from the enumeration in Phase I of the ROFEAP turn out to be quite different from the statistics of registered factories of the Ministry of Industry (MOI). The comparative data are shown in Table 4.3. In some cases, the MOI figures are substantially larger. In other cases, the Phase I survey results are much larger. It is noted that the MOI data cover all factories registered with the Ministry, which by law should be any firm with seven or more hired workers, or using machinery with two or more horsepower. The Phase I survey of ROFEAP thus also covered smaller firms not required to register with the MOI, or those which are eligible for registration but fail to do so.¹ On the other hand, the MOI data include complete districts, rather than just the municipal areas covered in the Phase I survey. In addition, in the ROFEAP survey, a few very large firms are excluded even though they are inside the municipal area. The two data sources are thus not comparable. The Phase I survey, including that on village survey of non-farm enterprises, however,

Table 4.3 : COMPARISON OF PHASE I SURVEY DATA WITH STATISTICS FROM THE MINISTRY OF INDUSTRY

Areas	Phase I Survey Data		Ministry of Industry ^a	
	Establishments	Employment	Establishments	Employment
<i>Chiang Mai:</i>				
Chiang Mai City	1,290	8,919	292	n.a.
San Kamphaeng	138	1,348	100	n.a.
San Pa Tong	60	589	121	n.a.
<i>Khon Kaen:</i>				
Khon Kaen City	490	3,734	377	5,016
Ban Phai	268	1,240	166	4,321
Chonnabot	639	1,514	25	103
Nam Phong	414	1,217	138	1,346
<i>Roi Et:</i>				
Roi Et City	257	1,444	130	690
Chaturapak Phiman	36	88	53	90
<i>Suphan Buri:</i>				
Suphan Buri City	212	1,262	92	286
Don Chedi	126	454	37	n.a.

^aFrom Provincial Offices of Industry, Ministry of Industry. All data refer to 1979.

Source: Donald C. Mead and Pradit Charsombut, *Rural Off-Farm Employment in Thailand: Phase I Survey Results*, Research Paper No. 2 of ROFEAP, Center for Applied Economics Research, Kasetsart University, June 1980, Table 10.

¹It is widely found in Thailand that there exist a large number of industrial establishments which meet the requirement for registration, but have not registered with the MOI. These "illegal factories" are mostly small scale industrial establishments.

show the predominant of small scale industrial enterprises in rural areas, and the serious underestimation of the official statistics on industrial activities in provincial areas.¹

4.12 Eventhough the ROFEAP survey provides useful information in certain industrial activities in various provincial towns in Thailand, we should also realize the limitations of the industry studies before summarizing the major findings of these studies. Because of the deliberate selection of locations of provinces (and towns and villages) of ROFEAP to represent different levels of economic development in terms of agricultural pattern and non-farm activities, and accessibility to the survey staff, it is possible that situations of industrial activities in the surveyed areas are quite different from other areas with different socio-economic conditions. On the one hand, the selected locations may not be representative of remote, inaccessible areas in the provinces covered by the study. On the other hand, the exclusion of Suphan Buri for detailed industry study may prevent us to gain knowledge of industrial activities in a relatively well-developed province in the Central region. It is possible that industries selected for study in certain provinces in the North and Northeast are not available in other regions of the country. However, this criticism on representativeness may be more applicable to village-level studies, as villages are chosen such that non-farm activities are widely in existence. Considering the types of town industry selected for the survey, one could expect that except for certain types of industry, such as silk and wood handicraft, other industries are widely found in provincial areas. The various characteristics and problems found by the town industry survey are also quite similar to those found in other studies on small scale industry² in Thailand. Thus, eventhough some important industrial activities available in provincial towns such as metal products and various types of repair services as well as some large scale industries located in provincial areas (such as sugar milling, fruit canning and animal feed) are excluded from the ROFEAP industry study, the information obtained could still give much insights to the understanding of rural-town industries.

C. OPERATION CHARACTERISTICS OF TOWN INDUSTRY

Production and Marketing

4.13 Although there exist various types of industrial activities in rural towns, and existence of major industries are different in different locations, the industries mostly found in rural towns are processed food and other agricultural processing industries, textiles and related industries, and various types of repair services. Industrial enterprises located in provincial towns are mostly family enterprises with a few hired workers. Over half of the industrial establishments in provincial towns found in the enumeration of Phase I survey of ROFEAP do not use any power-driven machinery. But the average size of the non-mechanized establishments is less than half that of the mechanized producers. As a result, the total employment in enterprises using power-driven machinery is higher. For establishments not using power machinery, over half of them are workshop in the house or connected to a detached residence. For enterprises making use of power-driven machinery, the most frequently found category is a workshop adjoining other buildings, but establishments in the house or connected to a detached residence are also commonly found (see Table 4.4)

4.14 From various industry studies in ROFEAP, it is found that three important factors, either singly or in combination, are essential for the existence and further growth of small industries in rural

¹ The village headman survey in Phase I of ROFEAP, for example, indicates that in 74 villages, there exist 6,299 non-farm enterprises, most of which engage in industrial activities.

² See, for example, Saeng Sanguanruang, Somsak Tambunlertchai, and Nit Sammapan, *A Study of Small and Medium Scale Industry in Thailand (in Thai)*, National Institute of Development Administration and Thammasat University, 1977, and Saeng Sanguanruang, Nisa Xuto, Preeyanuch Saengpassorn, and Chucheep Piputsitee, *Development of Small and Medium Manufacturing Enterprises in Thailand*, Association of Development, Research and Training Institute of Asia and Pacific (ADIPA), 1978.

Table 4.4 : PHASE I TOWN SURVEY : WORK PLACE CHARACTERISTICS : ALL ESTABLISHMENTS EXCEPT COMMERCE SECTOR

	With power-driven machinery			Without power-driven machinery		
	Establishments	Employment	Ave. employment per establishment	Establishments	Employment	Ave. employment per establishment
Factory compound with several buildings	45	1,879	41.8	9	102	11.3
Factory compound with one building	117	1,359	11.6	54	386	7.1
Factory compound with workshops and separate residence building	174	2,462	14.1	98	804	8.2
Workshop adjoining other workshop or buildings	770	4,031	5.2	594	2,201	3.7
Workshop connected to detached residence	167	1,591	9.5	95	556	5.9
Workshop in house	379	2,179	5.7	1,398	3,960	2.8
Outside	10	125	12.5	15	74	4.9
Total	1,660	13,626	8.2	2,263	8,083	3.6

Source: Donald C. Mead and Pradit Charsoambut, *Rural Off-Farm Employment in Thailand: Phase I Survey Results*, op. cit., Table 9.

areas.¹ These include the existence of sufficient local demand for the product, the proximity of raw material supplies, and the availability of skilled and semi-skilled workers. The dependence on each factor is of course different from industry to industry. Food and other types of processed agricultural products, for example, are heavily dependent on the availability of local raw materials, whereas textile weaving and ready-made garments are more market-oriented. In the case of wood handicraft and silk, besides the availability of raw materials, it is the development of skills obtained through a long period of specialized pattern of production in specific areas that contribute to the existence and growth of these industries. In most cases, however, the three factors tend to work together to give comparative advantage to rural industries which enable them to thrive in the face of potential competition from larger producers outside the region.

4.15 In Table 4.5, various industries covered in ROFEAP are divided into 4 groups in accordance to their dependence on raw materials, market orientation and skill requirements.² Six industries listed in Group 1 are those which use almost entirely local raw materials, sell mostly in local market, and require mostly modest skills. The second group of industries is made up of those which rely heavily on raw materials brought from outside regions, and sell in both regional and national markets. Some products in this group require skilled workers, and some require only moderate skill. The industries in this group also tend to have a high degree of product differentiation compared with those in other groups.

4.16 Cement products are left in separate category in the listing. They resemble Group 2 in that they rely on diverse sources for their raw materials, but differentiation is small and skill requirement is modest.

¹ Donald C. Mead, "Pattern of Rural Industrial Growth: Some Generalization from Thailand", Paper presented at a Conference on ROFEAP, Pattaya, Thailand, September 18-19, 1982, and Pradit Charsoambut, "Small Industry in Provincial Areas: Structure, Problems and Potential for Development". (in Thai), Paper presented at a Conference on ROFEAP, Pattaya, Thailand, September 18-19, 1982.

² Donald C. Mead, "Pattern of Rural Industrial Growth: Some Generalization from Thailand", op.cit. In this paper, Mead also discusses the growth potential for each group of industry.

4.17 The two industries in Group 4 are largely village-level industries. They use purely local raw materials, but sell in markets which are both local and national. The required production skills are modest and widely available.

4.18 As seen in Table 4.5 the demand for products manufactured by rural industries are mostly local in nature. For most town industries, the ultimate customers constitute mostly the residents in

Table 4.5 : SELECTED CHARACTERISTICS OF MAJOR INDUSTRIES IN RURAL AREAS OF THAILAND

Industry	Raw Material Source	Location of Market for Output	Skill Level of Labor Force
<i>Group 1</i>			
Fruit and vegetable pickling	Local	Local (and national)	High, for management, Low for others
Noodles	Local	Local	Average
Bean curds	Local	Local	Average
Metal tools	Local	Local	Medium to high
Bricks	Local	Local	Low
Pottery	Local	Local	Low of average
<i>Group 2</i>			
Furniture	Decreasingly local	Local (and national)	High in some firms
Wood carving	Decreasingly local	National	High for some producers
Silk weaving	Decreasingly local	Local (and national)	High for some producers
Cotton weaving	Mostly Bangkok	Local	Average
Ready-made garments	Bangkok	Local (and national)	High in some firms
<i>Group 3</i>			
Cement products	National and Local	Local	Average
<i>Group 4</i>			
Mats	Local	National (and local)	Average
Bamboo products (mostly baskets)	Local	National (and local)	Average

Source: Donald C. Mead, "Patterns of Rural Industrial Growth: Some Generalization from Thailand", *op.cit.*, Table 1.

the town where the industrial enterprises are located, and those in nearby villages. However, some of the town-based producers also have their markets expanded to big cities or even to international markets. These include firms producing silk, traditional garments, wood handicraft, and fruit and vegetable pickling. Increased number of tourists in Chiang Mai, for example, has generated increased demand for various traditional products manufactured by both town and village producers in the province. For some other products manufactured in rural villages or provincial towns, such as brick, hand tools, noodles and bean curds, the demand is limited to the local market. Expansion of market to outside regions for these products will be difficult, either because the availability of a large number of producers of the same products in other regions (such as noodles and bean curds), or the high transportation cost involved in sending the products (such as brick and cement product). The demand for these products can be expanded only with the increase in consumption of the local residents.

4.19 In the ROFEAP survey, it is found that the "putting out" or "subcontracting" system whereby materials and sometimes necessary tools and equipment are provided by town manufacturers to home workers for certain stages of production are widely practised in certain rural areas, particularly in the Northern province of Chiang Mai. This type of arrangements is found in the production of garments, silk, wood carving, furniture, fish nets, lacquerware, and metal bowls. For example, cloth is cut in factories in town and sent to rural households for sewing, or garments are sent for embroidery work. Handicraft shops in town may provide wood and designs to villagers for carving. In the production of silk, some of the largest producers may have only a few dyers and weavers in their own factories, and all the rest of work is done by way of subcontracting to villagers living nearby.¹

4.20 The existence of subcontracting is seen to have benefited rural households engaging in subcontracting work as well as town producers who are the subcontractors or "parent firms". Among the advantages to the rural economy of this type of system² are the flexibility of working time which make possible a reduction of under utilization of labor, particularly during the slack agricultural season; the development of skills; and the possible reduction of out migration of rural workers. Village households may receive very low wages or compensation for their work (usually at around 20 to 30 baht a day in the survey year). But the availability of this type of job opportunity could help to augment their income. In the part of the contractors, the system enables them to hire fewer permanent workers (which usually with a high rate of turnover); and the requirement on capital equipment could possibly be reduced (as in the case of garments, where village households often have their own sewing machines); wages paid to subcontracting workers could be lower compared to those paid to regular workers; and in some cases, skillfulness is better found in subcontracting households than in hired workers.

4.21 Subcontracting system does not seem, however, to be adequately found between large producers in Bangkok or in other cities and small industrial establishments in provincial towns. This may be due to the fact that products manufactured by large and small firms are quite different, and there also exist a wide gap in the technology employed. The possibility of subcontracting between large and small industrial enterprises either in cities or in towns seems however not to have been sufficiently studied in Thailand, and this subject needs to be further explored.

¹ Donald C. Mead, *Subcontracting in Rural Areas of Thailand*, Research Paper No. 5 of ROFEAP, Center For Applied Economics Research, Kasetsart University, November, 1981.

² Donald C. Mead, *Subcontracting in Rural Areas of Thailand*, *Ibid*; pp. 35-43.

Entrepreneurship and Management¹

4.22 Most of the town-based industrial enterprises are single proprietorship of which operations of business are closely tied with the owner's household. Where the firm is a partnership or company, the relationship of the partners is mostly relatives or friends. Most of the entrepreneurs are in their active period of life (the average age is 41). Almost all of them were born in Thailand and there are proportionally more Thais (67.6 percent) than other ethnic groups (the second largest ethnic group is Chinese). The entrepreneurs are originated from different types of family. The highest percentage comes from family engaged in trade or business (48 percent of total). The second largest group (30 percent) is from farming family. Only 10 percent of the entrepreneurs are from the family of government servants. Most of these entrepreneurs received very little formal education. But many of them have business background before the establishment of the present business either as children of businessmen or workers or apprentices in manufacturing enterprises.

4.23 The two most important reasons stated for entering into a particular business of the entrepreneurs, surveyed are the possession of experience in the business and the desire for more income compared to alternative occupations. Some entrepreneurs are also found to have more than one business such as in commerce, banking, and insurance besides manufacturing. Most of the entrepreneurs tend to set up their firms in the same region in which they were born.

4.24 The owner of the enterprise usually manages the business and makes all the important decisions in production, sales, finance and hiring of labor. Sometimes the decision making is helped by other members of the family or other partners. About half of the enterprises surveyed keep basic book of accounts. Others keep only a cash book and some don't keep any record at all. Only 22.3 percent of the enterprises prepared profit and loss statements. Little effort seem to be made in drawing conclusions from the records to guide future operations. In the majority of enterprises the products are the same as those they produced when started up the business and no new product has been added. In a significant number of cases (64 percent of total) changing the quality of products is not considered. In other cases, the quality of the product has been improved or new products introduced to satisfy the need of the customers or to cope with more severe competition.

4.25 It is found that the performance of the firm in terms of profitability and net return to labor is influenced by the background of the entrepreneurs and management style, in addition to other factors such as types of industry, skill requirements of the products, location of the firms and capacity utilization. Entrepreneurs with higher education usually have better performance. Those with Chinese ethnic background also tend to have better performance compared with entrepreneurs of other ethnic groups, and male entrepreneurs tend to do a better job than female in running their business. Previous experience of the entrepreneur and better departmentalization and record keeping also contribute positively to the performance of the firm. The differences in size seem to affect little on the performance of the firm in general. Large sized firms tend to have higher labor productivity due to the higher capital intensity in their production. But capital intensity is found to be negatively related with profitability.²

¹ This section has largely been summarized from Preeyanuch Apibunyopas, *Entrepreneurship: A Survey Result*, Working Paper No. 18 of ROFEAP, Center for Applied Economics Research, Kasetsart University, November, 1980 and Preeyanuch Apibunyopas, *Entrepreneurship and the Performance of Non-Farm Firms*, Conference Paper No. 8 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981.

² Vinai Artkongharn, *Profitability and Efficiency*, Conference Paper No. 6 of ROFEAP, Center for Applied Economics Research, Kasetsart University 1981, Preeyanuch Apibunyopas, *Entrepreneurship and the Performance of Non-Farm Firms*, op.cit., Vinai Artkongharn, *Profitability and Efficiency*, Research Paper No. 18 of ROFEAP, Center For Applied Economics Research, Kasetsart University, January, 1983, and Donald C. Mead and Vinai Artkongharn, *Profitability and Efficiency-Some Preliminary Survey Results*, Working Paper No. 10 of ROFEAP, Center for Applied Economics Research, Kasetsart University, November, 1980.

Employment and Wages

4.26 Table 4.6 shows the characteristics of labor force for industrial establishments covered in the pre-town survey of the ROFEAP in Phase I. Over half of the labor force of town industries covered in the survey are hired workers. Reliance on family members is much higher among the smaller firms, accounting for two-thirds of all workers. Only metal products and repair shops are there significant members of hired workers, among small producers. About 40 percent of the labor force are female workers. Female workers are found more in textiles and related products, mat and bamboo products while male workers are predominant in industries such as food and repair services. There is considerable seasonal variation in employment. The maximum employment is 1.8 times that of minimum.

Table 4.6 : PHASE I TOWN SURVEY : LABOR FORCE CHARACTERISTICS : ALL ESTABLISHMENTS EXCEPT COMMERCE SECTOR

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Total
No. of Establishments	1,488	1,811	293	338	3,930
No. of workers employed during survey week:					
Male	6,549	3,932	1,156	1,221	12,858
Female	4,307	3,773	371	495	8,946
Total	10,856	7,705	1,527	1,716	21,804
Hired	6,507	3,473	841	815	11,636
Family members	1,671	2,260	310	385	4,626
Working proprietors	1,774	1,447	297	325	3,843
Apprentices	904	525	79	191	1,699
Total	10,856	7,705	1,527	1,716	21,804
Workers during past twelve months					
Maximum	13,259	8,641	1,806	1,860	25,566
Minimum	7,751	4,676	893	1,113	14,433
Males/Total workers	.60	.51	.75	.71	.58
Hired/Total workers	.60	.45	.55	.47	.53
Workers/Establishments	7.3	4.3	5.2	5.1	5.5
Max/Min employment	1.71	1.85	2.02	1.67	1.77

Source: Donald C. Mead and Pradit Charsombut, Rural Off-Farm Employment in Thailand: Phase I Survey Results, op. cit., Table 5.

4.27 The variation in employment appears not only in agro industries but also in other manufacturing enterprises as well (Table 4.7). The variation in employment is due either to the seasonality of raw material supply, availability of labor, or seasonality of the demand for the product, again reflecting the close link between agricultural and manufacturing activities in rural areas. It is interesting to note that it has been found to be an inverse relationship between the degree of seasonal variability in employment in urban industrial activities in a province and the average level of per capita income in that province. In Roi Et, the poorest province covered in the ROFEAP study, the seasonality is high, while in Suphan Buri and Chiang Mai the industrial sector is based on a more stable urban labor force. This is hypothesized to reflect the differences in the level of urban industrial development of the different provinces.¹

4.28 Wage data are not adequately collected in the ROFEAP study and only wages for a few industries are reported. Wages received by workers differ from one industry to another. Wages in different regions are also quite different. In general, town-based workers earn more than villagers. Wages received also depend on skill requirement. For example, average wage in carving of wood handicraft for unskilled workers is ฿40 a day and for skilled workers is ฿125 a day. Finishers of wood handicraft receive substantially lower wages (฿75 a day and ฿28 a day for skilled and unskilled workers, respectively, due to the less complicated work involved in finishing compared to carving). Wages in the Northeast are much lower. A skilled weaver of patterned silk fabric receives ฿40–50 a day while an unskilled worker could receive as low as ฿16 a day. In general, the average wage for an 8 hour working

Table 4.7 : VARIATION IN EMPLOYMENT BY INDUSTRIES

Industry	Maximum Employment (persons)	Minimum Employment (persons)	Ratio of Max./Min.
1. Agriculture, food and related products	5,171	2,674	1:934
2. Textiles and wearing apparel	5,965	3,526	1:692
3. Wood, bamboo, and cane products	4,727	2,217	2:132
4. Non-metallic minerals, including ceramics	1,050	660	1:591
5. Metal products	1,776	1,050	1:691
6. Chemicals and chemical products	493	240	2:054
7. Commerce	8,730	6,148	1:420
8. Services	5,091	3,209	1:586
9. Miscellaneous	1,271	823	1:479
Total	34,220	20,547	1:665

Source: Donald C. Mead and Pradit Charsombut, *Rural Off-Farm Employment in Thailand: Phase I Survey Results*, op. cit., Table 7.

¹ Donald C. Mead and Pradit Charsombut, *Rural Off-Farm Employment in Thailand: Phase I Survey Results*, op. cit., page 25.

day in the North and Northeast is approximately ฿40–50 for skilled workers and ฿20–30 for unskilled workers. Wage rates for unskilled workers in town industries in the North and Northeast are thus substantially lower than the legal minimum wage.¹

Finance²

4.29 The size of firms covered in the ROFEAP in terms of total assets varied greatly among different industries. The average investment in assets ranged from ฿0.14 million in silk weaving to over ฿2.6 million in brick and cement products. The average assets for all town industrial enterprises covered in the study is ฿0.64 million. Of this amount 75 percent is investment in fixed assets. But investment in fixed assets also varies among industries. This is due to the difference in the structure of assets. Production of brick, cement products and wood carving require heavy investment in machinery, land, and vehicles. Noodles and bean curds industries also require high investment in machinery and vehicles. So the proportion of investment made on fixed assets for these industries is high. Fruit and vegetable processing, furniture, silk and garments, on the other hand, do not require much machinery. The investment is mostly made on land and building. They also require a relatively higher proportion of funds for storing up their inventory of products and raw materials, so the proportion of current assets are relatively higher. Although the amount of investment varies by the size of the firm, in general industries with higher capital intensities require higher amount of investment funds, and also tend to spend a large proportion of their investment in fixed assets.

4.30 The portion of total assets financed by outside borrowing varied across industries. For examples silk weavers have only 3 percent of their total investment financed by outside borrowing, while 40 percent of the investment in cement products, garments, and fruits and vegetable processing are financed by outside credits. In general industrial enterprises in provincial towns rely more on their own savings than outside borrowing. On the average, 70 percent of the investment funds is financed by the firms' retained earnings or the owners' personal funds and only 30 percent of the investment is financed by credits obtained from outside borrowing, both from organized and unorganized financial source.

4.31 Out of the funds borrowed, 55 percent is in long-term credit and the remaining 45 percent is in short-term credit. The most important source of long-term finance (over 80 percent) is commercial banks. Although the lending contracts are made in short-term basis (mostly in terms of overdraft), but due to the shortage of other sources of funds, firms usually use significant portion of loans from commercial bank for long-term investment. Other sources of long-term finance are borrowing from relatives and friends, sometimes through "share" or rotating credit arrangement, and from input suppliers. The rate of interest charged by commercial banks and relatives and friends, is 18 percent on the average, while that from input suppliers is much higher. For short-term credits, the important sources of supply are relatives and friends and input suppliers. The interest rates charged are very high for short-term credits. The interest rates charged by input suppliers range from 2 to 210 percent, and the median rate being 106 percent. Commercial banks are also an important source of short-term credits.

¹In 1980, manufacturing value added in the Central region including Bangkok accounted for 87.7 percent of the total. The degree of geographical concentration also tends to increase overtime. See World Bank, *Thailand's Industrial Sector Report, Volume I, the Main Report, August 1982, Table 4.4.*

²This section has summarized mainly from Saroj Aungsumalin, *Financial and Economic Analysis of Selected Small Scale Industries, Working Paper No. 13 of ROFEAP, Center For Applied Economics Research, Kasetsart University, November, 1980*, Saroj Aungsumalin, *Financial Structure and Percention Toward Constraints, Conference Paper No. 10 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981*, Saroj Aungsumalin, "Financial Structure and Credit Requirement of Small Scale Enterprises" (in Thai), Paper presented at a conference on ROFEAP, Pattaya, Thailand, September 18–19, 1982 and Tongroj Onchan, "Problems of Finance and Credit For Small Rural Industries" (in Thai), Paper presented at a Conference on ROFEAP, Pattaya, September 18–19, 1982.

Altogether, loans obtained from commercial banks for an average firm accounts for 50 percent of the total credits obtained, both long-term and short-term. We can thus say that industrial enterprises in provincial towns rely much on commercial banks for their finance.

4.32 The very reason that firms have to rely heavily on commercial banks for their finance is that there are few alternative sources where small industrial enterprises can obtain credits. Although there exists a number of financial institutions including the Industrial Finance Corporation of Thailand (IFCT), the Government Savings Bank (GSB), the Small Industry Finance Office (SIFO), and the Bank for Agriculture and Agricultural Cooperatives (BAAC), these institutions seem to offer little help on financial needs of small enterprises in the rural areas. IFCT until very recently has been interested in giving loans to large and medium scale industrial enterprises. SIFO is the only financial institution which was set up specially to give loans to small industrial enterprises. But the role played by SIFO in financing small scale enterprises has been extremely limited. SIFO has faced with a number of problems including lack of funds, inadequate manpower and inflexible administrative structure. SIFO has on the average been able to extend loans to less than 100 enterprises a year and the average amount of loans is less than B 30 million. More importantly, the loans extended by SIFO have mostly been confined to relatively modern enterprises in Bangkok and other cities, and only a few enterprises with good credit standing in provincial towns are able to obtain loans from SIFO. Unless the institution is completely restructured, it is hard to expect that it will play an important role to finance small scale industries in provincial towns. The GSB has so far been an effective agent in absorbing savings from small savers in various parts of the country, but making very little contribution by way of providing funds for long-term finance. The BAAC, on the other hand, has greatly expanded its lending capacity in recent years. But the loans are given to the agricultural sector. It is noted that for non-farm enterprises in rural villages, the loans from BAAC could have also provided some indirect credits for these enterprises through the provision of agricultural loans, although it is uncertain how significant this is.¹ Town-based manufacturing enterprises, however, are less likely to obtain this kind of indirect loans from the BAAC.

4.33 Given the limited sources of funds available, small industrial enterprises in rural areas have no choice but to rely on borrowing from commercial banks and other unorganized sources in financing their business. Borrowing from commercial banks, however, is also not easy for industrial enterprises located in provincial towns. Given the short-term nature of commercial bank deposits, commercial bank are more interested in lending to trading firms which require shorter-term credits. Moreover, lending to industrial enterprises would require evaluation of credit worthiness of producers in different industries producing different products and using different types of raw materials and capital equipment. Branches of commercial banks in provincial towns may lack the manpower to make such evaluation. An important obstacle in borrowing from commercial banks is the lack of systematic business records and lack of collateral. Thus despite the fact that about half of the outside borrowing is found to be from commercial banks, the finance obtained from commercial banks is still far from adequate for the normal operation of small enterprises in provincial towns, and the entrepreneurs have to rely heavily on their own savings and borrowing from unorganized sources for their financial needs. This seriously constraints their scale of operation and the potential for further growth.

¹Richard L. Meyer, *Formal Credit Supplies for Rural Enterprises*, Working Paper No. 9 of ROFEAP, Center for Applied Economics Research, Kasetsart University, November, 1981

D. PROBLEMS FACED BY TOWN-BASED INDUSTRY

Erosion of Advantage Position of Rural Industry?

4.34 It is noted by the ROFEAP study team that each of the three potential sources of strength of rural industries (i.e. existence of local demand, proximity to raw material supplies, and availability of skilled labor) is now increasingly under pressure.¹ The advantage in raw material supplies for some industries tends to be eroded either because of the depletion of certain types of raw materials (such as in cases of wood and clay) or the development of alternative raw materials such as in case of using plastic to replace natural reed in making mats). The advantage on proximity to local markets compared to firms outside the region may also be reduced due to improved information and transportation facilities. Even the availability of skilled workers which has been developed for a long time for some industries in some locations may also face the problem of reduction due to the migration of these workers to big cities in which they can earn higher wages. Industries in rural towns also have to increase their wage level close to that of big cities as transportation facilities improve, which results in the reduction of advantage in lower wages for rural industries.

4.35 Despite the possible waning of comparative advantage of rural industries described above, there are reasons to believe that certain industries can still survive and grow in both rural villages and provincial towns. For products which raw materials are accounting for a significant portion of the production value, rural producers with a convenient source of raw materials nearby still have a significant advantage over competition from outside.² On the problem of marketing, despite the possible competition from larger enterprises outside the region, various town and village industries can still survive and grow as a significant number of firms in rural towns tend to produce products different from larger firms. In some cases, transportation of products from outside regions is costly. Enterprises producing noodles and bean curds, for example, are likely to face with competition among the producers within the same town rather than those from outside. It is also noted that the improvement of information flows and market linkages although present new challenge to up-country producers, as their "protected" local market are threatened by outside producers, the improving linkages will also open up new opportunities for expanding sales in national and even international market for some industries.³

Shortage and Unstable Supply of Raw Materials

4.36 As mentioned above, a serious problem faced by a number of rural industries is the diminishing supply of raw materials. Enterprises producing wood furniture, wood carving and silk weaving are particularly hard hit by the shortage of raw materials and have to increasingly rely on raw materials from outside districts, which increase their costs. This has seriously threatened the survival of these industries.

4.37 There are also other problems on raw materials which tend to constraint the efficient operation of resource-based industries in provincial towns. Agricultural raw materials are usually available in a particular season in a year. Some types of raw materials such as fruit and vegetable cannot be kept for long. But even for those raw materials that could be stored, sufficient finance is required to stock up the material inputs to ensure sufficient input supply for year-round production. The shortage of funds will then hinder the firms to fully utilize their existing capacity.

¹ Donald C. Mead, "Pattern of Rural Industrial Growth", *op. cit.*, pp. 4-6.

² Donald C. Mead, "Pattern of Rural Industrial Growth", *ibid.*, page 8.

³ Donald C. Mead, "Pattern of Rural Industrial Growth", *ibid.*, pp. 23-24.

Problems on Labor, Management and Technology

4.38 The seasonal availability of workers also hinder industries in provincial town which heavily rely on village residents as their workforce to fully utilize their capacity. The lack of a stable workforce tends to obstruct the development of skills of workers, causing the lack of skilled workers for many town enterprises.

4.39 Another problem concerning labor is that on movements to larger size firms which pay higher wages. The raising of minimum wage rate in Chiang Mai and other cities thus not only affect larger enterprises which have to pay wages in accordance to the legal minimum, but also smaller firms as well.

4.40 Many of the problems confronted by small firms could have been due to the limitation in managerial capabilities of entrepreneurs in these firms. The case of the owner being the manager in a small firm may have an advantage of having greater flexibility in decision making. But as the firm grows larger, this advantage will become a disadvantage. Many entrepreneurs found in the ROFEAP survey have extensive experience in the particular industry they are operating. But there is also a lack of product development and improvement in the quality of product for most of the firms. There is also a lack of systematic record keeping and there seems to be no long-term planning in most of the firms. The low educational training of entrepreneurs perhaps contribute to some of these management and administrative problems.

4.41 The technology of production used in most town industries is rudimentary, and there seems to be no improvement on technology overtime. There also seems to be little access to information on technology by entrepreneurs of town industrial enterprises. Technology adaptation, if any, is mostly based on experience instead of from outside help. Firms located near the Chiang Mai city, however, tend to have better access to the services of the Industrial Service Institute (ISI) in Chiang Mai, which provides training to workers and helps make product adaptation to small industrial enterprises.

Shortage of Funds

4.42 Finance is always one of the important problems for industrial enterprises. Small scale enterprises in rural areas need much less capital to start up their business. But they are also much less capable compared to larger enterprises located in cities to raise funds. The shortage of funds seem to be a serious constraint limiting the growth potential of rural industries. As described earlier, it is very difficult for small scale industries in provincial areas to obtain long term credits for expansion of their business. There is also a severe shortage of working capital in many firms. In the ROFEAP survey, it is found that over 95 percent of industrial enterprises in rural towns have never obtained long term credit from any financial institutions.¹ Many of them utilize overdraft from commercial banks to purchase their fixed assets. This has placed them in a very difficult situation, and they have to resort to high interest loans in the unorganized markets for additional short-term financial needs.

4.43 Industries in provincial towns usually have high seasonality in their need for working capital due to the seasonal fluctuations in the demand for the products, or in the supply of their inputs. The lack of short-term finance during peak business season is thus commonly found and appear to be an important constraint to the production scale of many town industries.

¹ Saroj Aungsumalin, *Financial Structure and Perception Toward Constraints*, op.cit., page 20. Overdraft from commercial banks used for long-term investment is considered as short-term credit.

Problems on Marketing

4.44 The problems discussed so far are mostly problems on the supply side. A more serious constraint to growth of industrial enterprises in provincial areas is the limitation of demand for their products. Despite the fact that there are many problems exist on the supply side, existing rural industries will be able to survive if there are adequate demand for their product. New types of industries will not emerge even with the availability of raw materials, capital, labor and entrepreneurs if there is no demand for such industries. This explains why the industries commonly found in provincial towns are those with existing demand in the local market.

4.45 Besides possible competition from outside region, many of the town industries have to face with competition among the producers within the same town. There is a limit on local demand for industrial products. For some of the products, the entrepreneurs concerned are able to find marketing outlets outside the region. For other products, it is difficult to expand the market to other regions. The market for these latter types of products could grow only with the expansion of local demand as the income level of local residents grow. A problem faced by a number of town industries is thus the inadequate demand for their products.

E. CONCLUSIONS AND POLICY IMPLICATIONS

4.46 Industrial enterprises located in rural areas or provincial towns have many disadvantages compared to those located in Bangkok and other big cities. Given the limited scope of demand for their products, and the insufficient supporting facilities for rural industries, it may be very difficult for the government to devise measures to promote them. There are, however, strong justifications for the promotion of rural industries. Industrial enterprises located in rural areas or provincial towns in many cases possess several qualities which are desirable for industrial development. The existence of industrial activities in rural areas can help to generate income and employment in these areas. The development of industrial enterprises in provincial towns can also serve to contribute toward the reduction of heavy concentration of industrial activities in Bangkok and other provinces in the Central region.

4.47 Industrial enterprises located in provincial towns are usually found to have a close link with the rural economy. Manufacturers in town purchase their raw materials from nearby villages and also sell their products to the villagers. A significant number of village household members are employed in industrial firms in town, particularly during the slack agricultural season. In certain areas, there also exist a subcontracting relationship between manufacturers in town and farm households where part of the production process is done in rural villages. The interlinkage of village economy and industries in provincial towns suggest that the survival and growth of agricultural and industrial activities in the rural areas can be mutually reinforced. The increase in income of farm households either due to improved productivity or increase in the price of their agricultural products will not only provide additional savings for investment in non-farm activities, but also generate additional demand for products produced by town industries. On the other hand, the growth of town industries will generate additional employment opportunities to farm households, and additional demand for farm products which are used as raw materials. In this regard, the development of rural industries should be considered as an important ingredient for rural development. Similarly, policy measures designed for the promotion of industrial activities in rural areas and provincial towns should also take into consideration the situations in the agricultural sector. As rural industries rely heavily on local market as the outlet of their products, and also rely heavily on local labor and raw material supplies, the promotion of industrial activities in rural areas should thus take such factors as the availability of raw materials and labor force, and income and consumption pattern of rural residents into consideration.

4.48 The Department of Industrial Promotion of the Ministry of Industry has plans for conducting feasibility studies for industrial investment in provincial areas where potential for development is high.¹ It is important for this type of study to identify what are the factors already exist in the location under study which could help to generate industrial activities, and what are the factors that are still missing, so that the government can help to provide the missing factors wherever possible.

4.49 The major problems faced by industrial enterprises in provincial towns are lack of adequate demand for their products, shortage of raw materials, shortage of funds, lack of skilled workers, and inadequate managerial ability. The assistances to town industries should concentrate on these areas. The severity of the problems, however, are different for different industries in different locations, and the need for assistance of one industry in a particular locality may be quite different from another. In designing programs to promote provincial industries, the particular characteristics of different enterprises should be taken into consideration.

4.50 The generation of demand for industrial products is difficult in the short run. But government agencies concerned could help to provide market information, or help the manufacturers to improve the marketability of their products on various aspects, such as improvement in quality or design of the products. For products with potential to export, this type of assistance is particularly valuable.

4.51 The problem on shortage of raw materials affect much the operations of certain industries such as furniture, wood carving and cement products. The development of raw material sources and the provision of information on alternative raw material supplies could be helpful. In addition, the government should not interfere in the form of setting regulations on marketing channels, sales locations and prices, which will tend to retard the free movement of raw materials, and make the situations on shortage even worse.²

4.52 The assistance on finance is obviously an important ingredient for promotion of rural industries. Existing services and assistance on this area are extremely limited. Since SIFO is the only official institution that directly give financial assistance to small enterprises at present, the institution should be reorganized to give more flexibility in its operation and expand its present scope of services. If this is not possible, then the establishment of additional financial institutions which can render assistance to provincial industries should be considered. At any rate, to ensure accessibility of services of SIFO or other officially created financial institutions to rural industrial enterprises, more publicity needs to be made. As many regional branch offices as are economically justifiable should be set up. The co-operation with the Government Savings Bank (GSB), or Bank for Agriculture and Agricultural Co-operatives (BAAC) to use their office as loan windows should also be considered. The simplification of loan procedures and provision of advices on accounting and on other matters would be helpful to entrepreneurs of small enterprises who are usually with very low education.

4.53 Institutes like ISI can be helpful in training of workers. So far the Industrial Service Division (ISD) of the Ministry of Industry has only this branch office in Chiang Mai, although another branch office in Khon Kaen in the Northeast has been planned. But even if the Khon Kaen branch is set up, the services are still confined to a very limited areas. Given the limited manpower and other resources of the ISD, the setting up of small service centers each with a few technicians in various provinces of the country should be considered. Concentration on specific industries in specific locations may be planned. More emphasis could then be paid on training of skilled labor needed for production of a limited range of products important for the province.

¹Orapin Worawut, "Problems for Promoting Regional Industry" (in Thai), *Paper presented at a Conference on ROFEAP, Pattaya, Thailand, September 18-19, 1982.*

²Donald C. Mead, "Pattern of Rural Industrial Growth", *op. cit.*, pp. 14-15.

4.54 On entrepreneurship and management, a number of things could be done. Training and consulting services could be given on basic accounting, personnel management, cost control, management of inventory, improvement in the use of capital equipment, provision of information on technology and others. Again, given the manpower constraint in the Ministry of Industry, occasional training program may be organized in different areas where rural industries are located. Ways should also be found to help the development of potential entrepreneurs. The entrepreneurs of town industrial enterprises are mostly residents in that area, and an important reason they set up their business there is because they live there. If potential entrepreneurs could be developed along with the feasibility studies in investment, it may be possible to create additional rural industries.

4.55 As mentioned earlier, one of the reasons industrial enterprises are inclined not to set up in provincial towns is the lack of supporting activities there. The improvement in various infrastructural facilities such as electricity, water supply and telephone services could possibly contribute much to the dispersion of industries into provincial towns.

4.56 A more important issue of promoting provincial industries is the revision of industrial development policy in such a way that small scale enterprises located in provincial towns are not discriminated. Considering that there are so many small scale enterprises in various parts of the country, any assistance program would not be able to cover all or a significant portion of them. The correction of existing policy bias against small scale industry, including official investment promotion incentives, tariff and tax policies, could be among the important steps conducive to the efficient development of provincial industries. The present Fifth National Economic and Social Development Plan has more or less emphasized along this line. The effective implementation of policy measures conducive to the development of provincial industries is thus among the most important factor for the successful development of these industries.

Chapter 5

Role of Government in Off-Farm Income and Employment Promotion

by
Narongchai Akrasanee

ROLE OF GOVERNMENT IN OFF-FARM INCOME AND EMPLOYMENT PROMOTION

5.01 While ROFEAP has concentrated mainly on off-farm income and employment in industrial activities at the village and town levels, it should be pointed out that these activities are interrelated with income and employment in other activities. Thus as far as the role of the government in off-farm income and employment promotion is concerned, it should be viewed within the perspective of the overall role of the government in rural or regional development.

5.02 RTG policy affecting off-farm income and employment may be assessed from the current development plan, which is the Fifth Five-Year National Economic and Social Development Plan, covering the period 1982-1986.¹ In order to appreciate the rural and regional development policies it is necessary to point out that planning takes place at many levels in Thailand: from the general to the sectoral, from the national to the local, regional or provincial. Although there is increasing mention of decentralization in government policy discussion, the overall system is strongly centralized and flows from top to bottom, from center to periphery. Any concessions made to the periphery are inhibited in practice by the fact that all budgetary funds are allocated by the center and that capacity for planning at the local and regional levels is severely limited. The main problem of the system therefore, is one of coordination to assure that feedback flows effectively from the periphery to the center and from the sectoral planners to the overall planners.

5.03 Because of this center-periphery problem, the task of promoting off-farm income and employment has always been a difficult one. Generally all Thai development plans have emphasized regional and rural development. This is usually addressed in terms of sectoral development such as agriculture and industry, specific area development and town development, the social delivery programs, the rural poverty program, and the rural job creation programs.

5.04 In the Fifth Plan the issues concerning rural income and employment are made much more prominent than in earlier plans. Among the six main objectives it can be said that three have a direct bearing on rural income and employment. Firstly the structural adjustment plan to increase economic efficiency is to improve on agricultural productivity, to make the industrial sector more export oriented and diversified to rural areas (to be discussed in detail below), and to conserve energy. Secondly the plan to restructure and broaden the delivery of social services is aimed particularly at improving the livelihood of the rural people, thus making it possible for them to earn higher income. Finally the Fifth Plan has introduced a new approach to the eradication of poverty, i.e. the area-specific approach. In addition the government is continuing and intensifying the rural job creation program.

5.05 In terms of policy trends it can be said that more and more attention is being given to regional and rural development. The agricultural development policy has been specifically designed to increase yield per rai by means of water resource and other natural resources development, product diversifica-

¹ National Economic and Social Development Board, *The National Economic and Social Development Plan, 1982-1986*, Bangkok, 1982.

tion, free marketing, and encouraging initiatives of the private sector. The industrial development policy has been based on the realization that the industrial sector must be able to absorb more employment, because of the rapid increase in the labor force and the increasing difficulty of the agricultural sector in providing employment opportunities. Export orientation and rural industrialization are seen to be the way for the future. As for the policies on broadening the delivery of social services and rural poverty eradication programs, measures adopted for these policies have shown much more seriousness on the part of the government on these issues.

5.06 While it is without doubt that the government has become much more aware of the problems of rural income and employment, and has shown a higher degree of determination in dealing with the issues, it must at the same time be admitted that the problems are far from over. This is partly due to the institutional problems of the Thai economy, the subject which is beyond the scope of this report. But the difficulty is also due to the limitation on the part of the government to develop effective measures and mechanism to deal with the problems. This is very apparent in the case of the policy and program on rural industrialization.

5.07 Because of the emphasis of ROFEAP on industrial activities, we discuss in detail in this chapter the role of the government in rural industrialization.¹ In addition the role of the private sector and activities of certain donors on rural off-farm employment are also discussed.

A. INDUSTRIAL DEVELOPMENT FACILITATION AND SUPPORT

5.08 This section deals with industrial promotion activity that precedes, leads to or makes possible the establishment of specific enterprises. It may or may not be the result of official industrial policy implementation.

Promotional Measures

(a) Product and Production Information

5.09 If one considers the small industrial entrepreneurs as a group, the process by which they become aware of a product to be developed profitably is probably as varied as the number of entrepreneurs themselves. One can only guess at this stage but it would seem that the rate of involvement of industrial promotion related institutions in this process is very low in town areas. Its occurrence is most clearly in evidence in the case of home industry and handicraft production in rural areas. All of the "generalist" supportive institutions play a brokerage or catalyst role in this respect in the areas in which they are active.² These include the CDD, ARD, PWD and, among the non-governmental organizations, the Population and Community Development Association (PDA). The range of products proposed for local production is very wide: silk and cotton production and weaving, clothes making, basketry, mats, artificial flowers, pottery, bricks, cement product making, food preparations, etc. Ideas are proposed to the villagers as employment generating projects, and if the schemes are accepted, follow-up support is arranged.

5.10 The ISI's are also involved in this activity by the organization of industrial products exhibitions and by the diffusion of literature on investment opportunities and enterprise development.

¹ Rural industries include town and village industries as discussed in Chapter 3 and Chapter 4.

² The term "generalist" institutions refers to those organizations having a general development promotion mandate extending to several sectors, as distinguished from specialized agencies such as the DIP having responsibility for one sector only.

5.11 The role of large private commercial firms is probably quite important in introducing new types of enterprises in rural areas but this has not yet been evaluated.

(b) Entrepreneurship Development

5.12 This activity is engaged in by the ISI's and relates more to small scale industry than to home industry. It consists essentially in identifying actual or potential entrepreneurs and providing them orientation for enterprise development. This activity was initiated only recently and is still in the development stage and not yet fully operational. Technical assistance is being sought of the TECHNO-NET Asia organization of which ISI is a network member to develop this program.

(c) Enterprise Development Feasibility

5.13 The DIP has prepared a comprehensive proposal for the Promotion of Regional Small-Scale Industry Development Project targeted for FY 1980-1981. Activity proposed under this project includes pre-investment surveys, feasibility studies of new factory projects, investment profit analysis and cost benefit analyses of selected projects. The main executing agency is the ISI but other units of the DIP and MOI would also become involved. A pilot project was begun in Nakhon Sawan but it is said to be currently in abeyance.

5.14 The Bangkok Bank is said to conduct its own feasibility studies on enterprises proposed for investment. The same is true for other financial institutions such as IFCT, TISCO, other commercial banks, etc.

(d) Promotional Privileges

5.15 Such an exemption from import duty, tax holidays and other special privileges are under the jurisdiction of the Board of Investment (BOI). The record shows that, in practice, the BOI has granted promotional privileges only to medium and large scale industries.

(e) Enterprise Implementation Assistance

5.16 The Investment Services Center of the BOI provides investment assistance e.g. to obtain clearance to establish a factory, to register an enterprise, to obtain duty clearance for imported machinery, etc. These services are available only to BOI promoted enterprises hence not to small scale industries.

5.17 The Thai Factory Development Co., (a subsidiary of the IFCT) provides assistance for building or purchasing factories. Entrepreneurs with the kind of capital that would require this assistance are not in the small scale category.

(f) Industry Siting Assistance: Industrial Zones and Estates

5.18 Industrial zones have been determined in 10 different areas in all regions of Thailand under the Investment Promotion Law with the specific purpose of encouraging industrial dispersion out of the Greater Bangkok area. Factories established in these zones are entitled to certain privileges beyond those accorded by the BOI to promoted industries, such as, allowing higher deductions for corporate income tax purposes for certain types of expenses incurred because of the remoteness of the factories e.g. additional freighting costs to the port of loading for export goods. As traditional and small scale industries do not usually meet the criteria to get these benefits and as these zones are not otherwise especially developed for industrial purposes, these small enterprises derive no advantage from being located in these areas.

5.19 These are areas under the jurisdiction of the Industrial Estate Authority of Thailand (IEAT) which have been especially developed for the siting of industrial enterprises and include all infrastructures needed such as roads, public utilities, standard factory buildings, waste disposal systems, etc. Three such estates are now in operation and five more are being developed. Existing estates are not suitable for small scale industry as the size of lots and buildings are much larger than needed or can be afforded. The plans of newer estates include areas specifically set aside for small scale industry. Moreover the development of two sites are being planned as specifically small scale industrial estates in Chiang Mai and Nakhon Si Thammarat to be implemented by the IEAT and the Thai Factory Development Co.

Industrial Skill Training

5.20 Both technical and non technical training is provided by several institutions. The most important are the following:

(a) Institutes for Skill Development (ISD) of the DOL.

5.21 There are five such institutes: one in Bangkok, two others in the Central Region, one in Lampang, and one in Khon Kaen. Their main and most important program is pre-employment training for youth in the 16-25 year age group having completed not less than the Pathom 4 and not more than the MS 3 grades of schooling. The training is basic and terminal and lasts from 4 to 14 months according to trade, including a period of infactory training. Trade training offerings are predominantly in areas in which industrial employment is most readily available, namely, in the mechanical and electronic fields, wood, metal and cement working, and construction. Training is also offered in non-technical fields such as training for factory foremen, infactory training officers, secretaries, receptionists, etc. Another program of the institutes provides shorter upgrading courses in the evenings for employed workers wanting to improve their skills. There is also a trade skill certification service for craftsmen without formal training, hence, without diploma or other documentary evidence of their skill level, which some employers require.

(b) Industrial Service Institutes (ISI) of the DIP in Bangkok and Chiang Mai.

5.22 Training provided by the ISI's is more specialized. Trainees are practicing craftsmen, many with vocational training. Supervisors and foremen are the main target group. Training is short, extending from 2 to 10 days. Each institute tends to be somewhat specialized according to the needs of their region. Thus, the Bangkok institute stresses metal working and furniture, that of Chiang Mai ceramic, lacquerware and wood working. The facilities and training provided by both are excellent but their function is rather different from that of the ISD's. For the former training is the only function. For the latter, training is only one element of an industrial promotion package. The Chiang Mai ISI, in particular, is geared directly to small scale enterprise development.

(c) Thailand Management Development and Productivity Center (TMDPC) of the DIP.

5.23 This center offers short term courses of about 5 days duration for industrial personnel in marketing, personnel relations, accounting organization, maintenance and safety. Four to five thousand persons a year undergo the training. Most are Bangkok based middle level management. The proportion of those in small scale industry is small.

(d) DIP Textile, Cottage Industry and Thai Handicrafts Promotion Divisions.

5.24 All three specialized divisions of the DIP have Bangkok based training staff who go into rural areas to train villagers in the various skills of their specialty. Training sessions are usually organized by field offices of other agencies: CDD, ARD, MDU etc. and some private organizations. Training in the

Chiang Mai area is usually coordinated by the Northern Region ISI. Training sessions can last up to six weeks in one locality. The Textile Division which is the most active in this enterprise has 80 trainers who do nothing but this. The main short-coming of this project is the lack of follow up. Because of this, much of the skill acquired by the villagers is not used and does not result in income generating activity.

(e) General Development Agencies: CDD, ARD, MDU, PWD, PDA.

5.25 As mentioned, these agencies have projects involving training but, in most instances, they do not conduct the training themselves. There are some notable exceptions however. The CDD regional Rural Development Centers are training centers for CDD related project activity, some of it relating to home industry. The ARD have more specialized technical staff than the other generalist agencies and they appear to contribute directly to agro-industry promotion in their own project areas. The PWD has centers in which simple crafts are taught to their own socially disadvantaged clientele but this activity provides little leverage for industrial development.

(f) Department of Vocational Education -- Technical Schools.

5.26 These are found in all provinces but are said to be less practical and employment oriented than, say, the ISD's.

Extension, R & D

(a) Extension

5.27 This is provided by the DIP industrial Service Institute and deals with both technical and non-technical (e.g. managerial) aspects. Interventions take the form either of trouble shooting, i.e. helping entrepreneurs solve their organizational or technical problem, or providing information on products or techniques. They seem to do this well.

5.28 Extension services are also provided by private firms such as the CP. Co., Adams International, and others, mainly in the area of agro-industry, in relation to entrepreneurs who enter into contractual arrangements with them to do work on consignment. These interventions appear to be important sources of innovation.

5.29 The DIP Textile Division provides substantial extension services to the textile industry but mainly to medium and large scale industry. It has good laboratories and technical library.

(b) Research and Development

5.30 Research and development on new products and on new/appropriate technology. Institutions that appear to be of most relevance to small enterprise in this report are as follows:

- (i) ISI. Institutes both in Bangkok and Chiang Mai are doing excellent R & D. Areas stressed are mainly pottery and ceramic, lacquerware, wood products and furniture, metal working. An interesting aspect is that this R & D is incorporated into their training programs, thereby assuring the diffusion of the new technologies. The ISI also obtains the collaboration of manufacturers, e.g. of furniture, to get them to participate in exhibits for the trade to illustrate the use of new materials or technology.
- (ii) DIP Textile Division. This division has excellent staff and facilities to conduct R & D on textile and weaving technology. Their most sophisticated work is for the benefit of medium and large industry but some is directed to home industry.

- (iii) Institutes for Skill Development. Although R & D are not the mandate of the ISD's, that of Khon Kaen, for example has excellent and sophisticated equipment and the staff is very resourceful and innovative. It could play a role both in upgrading the technology of Northeastern small scale industry and in developing appropriate technology.
- (iv) Thailand Institute of Science and Technology Research (TISTR-ex ASRCT). This institute plays an active role in R & D and collaborates closely with the ISI.

5.31 There are obviously many other institutions involved in industry related R & D in Thailand which were not covered by the study. These would include, among others, universities and technical colleges and R & D units of several Ministries. The following will serve as illustrations:

- (i) Ministry of Agriculture
 - Royal Forestry Department
 - Forest Products Research Division
 - Department of Agriculture
 - Sericulture Division
 - Agricultural Engineering Division
 - Dairy Farming Promotion Organization of Thailand
- (ii) Ministry of Science, Technology and Energy
 - Department of Science Service:
 - Ceramic Industry Research and Development Center

Financing and Credit

(a) The Small Industry Finance Office (SIFO)

5.32 SIFO was established under the supervision of the DIP for the purpose of giving long and medium term loans of less than ฿ 500,000 to small scale industries in the private sector at a low rate of interest. The project was set up in cooperation with the Krung Thai Bank which provides 2/3 of the loan fund, the remaining 1/3 coming from the government budget. Loan ceilings were later raised to ฿ 1 million and the rate of interest adjusted from time to time depending on the market interest rate. Requests for loans are processed by SIFO examiners but the loans themselves are executed by the Krung Thai Bank. All enterprises requesting loans must be properly registered. Collateral is required which is said to be estimated very conservatively. Recently only a few loans have been approved due to administration problems at SIFO, and between SIFO and the Krung Thai Bank. Funds are clearly inadequate to meet the demands of small entrepreneurs who complain that the loan ceiling is too low. There are some who argue against SIFO and the policy of subsidizing credit making the case that entrepreneurs with sound projects can always obtain loans from commercial banks, that what is essential is the availability of credit and that the rate of interest is of secondary importance. SIFO takes the opposite position and argues that loans to small entrepreneurs can only be handled by an organization like itself where service takes priority over profit. By all appearances SIFO will be disbanded and replaced by an organization called Small Industry Finance Corporation of Thailand (SIFCT). Most recent indications are that it will be set up as a State Enterprise.

(b) Industrial Finance Corporation of Thailand (IFCT)

5.33 The IFCT is not a government enterprise although it is strongly supported by the Thai Government and the Bank of Thailand and presumably controlled by them to a large extent. The latter assumption is suggested by a recent announcement of the President of the Corporation Mr. Sukree

Kaocharoen on its development strategy up to 1983. It includes, among other points, the promotion of export-oriented projects, the financing of projects aimed at conserving energy, greater effort to develop outlying area projects, assistance to small industrial projects in rural areas, promotion of labor-intensive projects, the financing of pollution control and prevention in industry all of which very much reflects current government policy concerns. The IFCT was set up in 1960 on the so-called World Bank model and has received important loans from the World Bank and the Asian Development Bank. In 1977, 53 percent of its shares were Thai owned, the remaining 47 percent being owned by banks of Japan, Germany, USA and Hong Kong. At that time, 53 percent of its investment was in the Greater Bangkok area although there was also heavy involvement in rural areas, mostly in agro-industry. Its involvement is with small, medium and large scale industry, but proportionately more funds have been lent to medium and large scale industry. As it is a profit making organization and given the high cost of administering small loans, the support of mainly small enterprises was seen as falling beyond its scope of activity but the Corporation is now showing a willingness to becoming involved. A special scheme is being considered for this purpose. As procedures are shortened and simplified and as the branch network is increased, it is hoped that loans can be made to small enterprises at a rate substantially below market costs. As mentioned above, the IFCT is already involved in a project to provide industrial sites and buildings in the provinces for small enterprises through its subsidiary, the Thai Factory Development Co.

(c) Other Government Sources

5.34 The CDD in collaboration with the Krung Thai Bank sponsors the Savings for Production Groups project which makes limited funds available for loans for home industry types of activity, among others. The ARD makes small sums available for such projects by the groups they sponsor. Youth Group projects for example. The Ministry of Commerce is said to have a credit program for lending to small traders.

(d) Commercial Banks

5.35 Commercial banks are not usually attracted to projects having high social benefit returns in a developing situation as this is usually inversely proportional to profit returns on investment. Consequently such projects are not considered "bankable". Unfortunately small scale industrial enterprises are often classified under this category.

5.36 The Krung Thai Bank more than others, has been involved in credit ventures with small scale industrial enterprises. Instances already noted are SIFO and the CDD Savings for Production Group. A probable explanation is its government connection as this bank is partially government owned. As already noted also, cooperation has only been half-hearted, more profitable alternate uses of available funds being available.

5.37 Siam Commercial Bank, has a scheme which is an experimental project to fund small and medium businesses. A provincial branch manager maintains however that as of now, the only small enterprises they are willing to finance are rice and cassava processing mills because of the lack of collateral and high rate of defaulting of small entrepreneurs.

5.38 Bangkok Bank is said to play a major role in the financing of rural projects and have a full range of services in this respect. It conducts its own feasibility studies, credit financing is advanced, managerial advice and extension services provided, and projects are monitored while in progress. It is not known, to what extent this activity includes support for off-farm projects.

(e) Other Private Sources

5.39 Large commercial firms can play a supportive role that is analogous to that of formal credit institutions for the entrepreneurs who do work on consignment for them. For example, the Bangkok Farming Co. (a member of the CP Group) provided a guarantee for a ฿5 million loan for an agro-business project of the Sankamphaeng Cooperative Village in Chiang Mai. Various inputs can be advanced on credit. For example, the Surapee Co. provides village weavers with dyed cotton thread to produce the cotton cloth they make on consignment for the company. The cost of these materials is deducted from the payment they receive for the finished cloth. This type of activity has yet to be investigated by the project however.

5.40 The Population and Community Development Association (PDA) has funds for a small loan program to finance home-industry projects that they promote.

Marketing Support

5.41 Thus far, this aspect of small enterprise institution support has only been investigated by the project for handicraft and home industry. It appears to be generally very weak and unprofessional.

(a) Government Agencies

5.42 Most of the generalist government development agencies engage in marketing activities as part of their handicraft promotion projects. Many have stores in different locations to sell this produce or function as brokers to find outlets. The effort is generally unprofessional and has more in common with social welfare than with sound business administration. The following three agencies are worth mentioning.

- (i) Thai Handicraft Center (Narayana Phand). The Thai Handicraft Center was established as a State Enterprise under the DIP some 10 years ago to serve as a market outlet for small producers of Thai handicraft. The original investment was ฿4 million. Its current sales volume is about ฿20 million a year. Sales are made on a wholesale and retail basis, locally and overseas. The Center has no system of buyers who travel regularly to production centers to solicit and purchase quality merchandise. In practice, it depends on its own regular suppliers who deliver their goods directly to the Bangkok store. No effort is made to improve the supply at source or to systematically gather market intelligence concerning supply and demand. There is no sales promotion. Lacking these functions, the effectiveness of the Center to promote the handicraft industry is very weak.
- (ii) The Roi Et Silk Industry Project. This project is a notable exception to the charge of unprofessionalism. The project was initiated by the governor of Roi Et as a changwat project financed by the changwat budget. It is executed by a committee composed of the Governor, the Deputy Governor, the Changwat Agricultural Officer, the Changwat CD Officer, the Changwat ARD Officer and the Head of the Agricultural Experimental Station, Cooperation being extended by all organizations represented. The merit of the project is that it brings together all of the elements required to assure that this home industry does in fact become income generating in a more than marginal way. Besides promoting quality silk production and training, the project also has an important marketing component, including market research. The project purchases the local silk production directly from the producers without passing through middlemen, and at a guaranteed price, using its own revolving fund. It then handles onward marketing of this production through provincial traders and Bangkok firms such as

the Jim Thompson Thai Silk Company. Market intelligence on overseas demand is provided by the Queens' Foundation for the Promotion of Special Artistic Crafts which also markets some of the best quality production. The project assures that the village producers get a fair share of the profit from sales in external markets. This model is strongly recommended by the DIP.

- (iii) The Northern Region ISI in Chiang Mai. This institute does modest market research in its area and does some sales promotion of its products by organizing exhibits and putting wholesale buyers in contact with products.

5.43 Looking now at marketing support in a broader perspective including not only handicraft, the Ministry of Commerce has a number of units and activities that are still to be investigated by the study. They are of potential relevance to small scale industry development although it is doubtful that their services are used by the small entrepreneurs. A few hopefuls are the following:

- (i) Department of Foreign Trade. It has a Commodity Standards Division which provides quality certification and guarantees for agricultural product export. (The DIP Thai Handicraft Center issues certificates of origin for handicraft products.)
- (ii) Department of Internal Trade.
- (iii) Department of Business Economics. Commodity and Marketing Research Division.
- (iv) Department of Commercial Relations. Its Trade Development Division has an Export Service Center which provides assistance and information to exporters on procedures, marketing and sales.

(b) Private Agencies

5.44 A large number of private agencies involve in the marketing of small enterprises's products. Most of them have a very limited role, though attempts have been made recently to accelerate their capability. Among those private agencies, some of them will be discussed below.

- (i) Volunteer organizations. The most notable of these from the point of view of marketing assistance is the Queen's Foundation for the Promotion of Special Artistic Crafts which appears to be the most professional. Examples of other organizations playing a similar role but at a much lower level are the National Council of Women of Thailand and The Social Welfare Council of Thailand.
- (ii) The Surapee Company, Besides serving as a market outlet for village handicraft produce, this company plays an active promotional role both for product development as well as for sales. It is a very small operation however and limited to 3 or 4 villages in the Northeast.
- (iii) Some larger stores function as wholesale outlets for producers. Examples are 3 large stores in Chiang Mai: Chinnawat, Phromchana and Plenkusun which buy up home produced handicraft, including ready made clothes for resale in Bangkok and abroad. In Bangkok, the Central Department Store has a sizable Thai handicraft department.
- (iv) Population and Community Development Association (PDA). The PDA has an interesting set-up that could perhaps play a useful role for the marketing of handicraft. It has used its extensive village network to organize the marketing of agricultural produce

most effectively, putting the villagers directly in contact with sales outlets not normally accessible to them. Given the extreme atomization and dispersal of handicraft producers, such a system could perhaps serve as a model to consolidate the producers and develop the industry into something more substantial than its at present.

- (v) **Private Sector Trading Companies.** Of recent years a number of export oriented trading companies have been granted promotional privileges by the BOI for the purpose of increasing the export of Thai product other than the traditional export earners, the stress being on labor intensive manufactured goods. According to an NESDB source, they have expanded the volume of exports much more than expected. They are expected to be of benefit to manufacturers for finding markets, and to buyers for getting good export ideas. Targets are imposed by the BOI: B 300 million for the 1st year, B 400 million for the 2nd, and B 500 million for the third. They must be Thai managed and controlled and go public after 5 years. If the requirements are met, they are entitled to certain incentives such as tax exemptions and special loans from the Bangkok of Thailand at a 7 percent rate of interest. Six such trading companies have begun operations so far and 8 others have been approved. Those already operating including:

- Export Development Corporation Ltd. (PSA Group)
- Asoke International Trading Company
- Texport International Corporation
- SM International Trading Company
- Siam Cement Trading Company

As these firms are under pressure to meet their government imposed targets, they end up dealing in a very wide variety of produce: motorcycle helmets, industrial gloves, belts, frozen squid, furniture or pottery, for example. A view of one small entrepreneur is that these firms are monopolizers and create obstacles for the development of small firms. It remains to be seen if this is true in all cases and if working relations cannot be developed with small firms who lack the capacity to deal directly with an international market.

B. RURAL INDUSTRIALIZATION AND INDUSTRIAL POLICY

Regional and Rural Industrialization and Employment

5.45 In the following we shall discuss the pattern of regional and rural industries, defined as industries, which are located in area outside Bangkok (which includes Thonburi), Nontaburi, Pathumtani and Samutprakarn. These areas may be in the provincial capitals, in other municipal areas, and in rural areas. Factory statistics used is the record of registered factories at the Ministry of Industry, which does not include a large number of cottage industries.

5.46 Industrial activities are highly concentrated in the Central Region. In terms of value added, industrial production in the Central Region accounted for 87.8 percent of the total value added in 1982, while the other three regions each accounted for about 3.6 to 4.6 percent (Table 5.1). Most of value added originating from the Central Region are from the Greater Bangkok area, with the Bangkok Metropolis alone accounting for about half of the amount¹. Thus by this indication value added from the true rural industries is very small.

¹ Information from the National Economic and Social Development Board (NESDB).

Table 5.1 : BASIC STATISTICS ON REGIONAL INDUSTRIES

	Year	Central	South	North	Northeast	Total
1. Population (million persons)	1976	14.1	5.3	9.0	14.8	43.2
	1982	16.3	6.0	9.8	16.7	48.8
2. GDP From manufacturing	1976	54.8	1.9	3.3	3.0	63.0
	1980	118.1	4.9	5.4	6.1	134.5
3. Distribution of manufacturing Value added by region	1976	87.0	3.0	5.2	4.8	100.0
	1980	87.8	3.6	4.0	4.6	100.0
4. Growth rates of manufacturing Value added	1976-1980	21.2	26.7	13.1	19.4	20.9
5. Share of manufacturing value added in regional GDP	1976	25.7	5.0	6.1	6.1	18.7
	1980	27.1	6.0	5.9	6.4	19.6
6. Distribution of products by region						
6.1 Office of The Board of Investment	1960-1982	84.7	7.1	5.6	2.6	100.0
6.2 IFCT	1960-1981	76.8	7.2	7.9	8.1	100.0
6.3 SIFO	1964-1981	63.9	7.2	12.5	16.4	100.0
7. No. of factories	1973	14,654	4,258	6,202	10,743	36,057
	(Percent)	(41.2)	(11.8)	(17.2)	(29.8)	(100.0)
	BKK	8,293	-	-	-	-
	(Percent)	(23.0)	-	-	-	-
	1979	27,718	6,797	10,885	22,336	67,736
	(Percent)	(40.9)	(10.0)	(16.1)	(33.0)	(100.0)
BKK	14,337	-	-	-	-	
(Percent)	(21.2)	-	-	-	-	
8. Ranking of Industries (based on No. of factories)						
Rank 1		Processed foods	Wood products	Tobacco	Processed foods	
Rank 2		Textiles	Rubber & rubber products	Processed food	Textiles & non-metallic mineral products	
Rank 3		Chemical products & wood	Processed food	Wood products		

SOURCE: NESDB

5.47 The pattern of regional distribution of industries may also be seen from the number of registered factories. By this account 40.9 percent of the registered factories in 1978 were in the Central region, with 21.2 percent in Greater Bangkok. Factories in the Northeast accounted for about 33 percent while the North and the South had about 16 and 10 percent, respectively (Table 5.1).

5.48 Comparing the distribution of industrial activities by the number of registered factories with the distribution by value added implies that firms in the Greater Bangkok Area tend to be larger in terms of value added than in rural areas. This is especially so when we take into consideration the existence of smaller factories which have not registered. Their inclusion would increase the proportion of factories in rural areas¹

5.49 For the whole kingdom industries producing food in one form or another are most numerous. But regional distribution by type of industries is different. According to a survey in 1978 the distribution of industries in each region is as below.¹

<u>Region</u>	<u>Rank of Importance</u> (in terms of number of establishments)		
	1	2	3
Greater Bangkok	Food	Textiles	Chemical products
Central	Food	Textiles	Wood processing
Northeast	Food	Wood processing	Textiles
North	Tobacco	Food	Non-metallic mineral product
South	Wood processing	Rubber and rubber products	Food

5.50 Another way of classifying industries is in terms of firm sizes and market orientation. Most large scale firms are located in the Greater Bangkok Area, which may produce goods for both exports and import substitutes. Large scale firms in rural areas, on the other hand, are mostly producing resource-based products for exports such as foods (canned pineapples), and rubber processing, etc. Large scale, labor intensive and export-oriented firms in rural areas are very few in number. The rest of the operations are considered to be small scale, producing products for local and domestic markets.

5.51 It is this latter type of operation which is the real potential for industrial employment and income in rural areas. This type of operation accounts for more than 50 percent of the total registered factories in the country, as implicitly mentioned earlier. These operations, as the research works of Dr. Mingsarn show, have low degree of capital intensity by any measures, and thus can generate more employment per unit of capital employed.

5.52 As discussed in Chapter 4, several characteristics of the small-scale rural industries are noteworthy. Apart from being labor intensive and producing products for domestic and local markets,

¹ Mingsarn Santikarn, *Regionalization of Industrial Growth*, Thai University Research Association, Report Prepared for the NESDB, 1980.

they tend to use local machinery, which is often an imitation of the imported ones. Raw materials used are mostly local. The production schedule is flexible, to allow for the seasonal nature of labor supply. The owners/entrepreneurs are usually local residents. Finally, they rely on their own fund and the commercial banks for project financing and working capital. These characteristics are crucial to the development policy for the small scale rural industries.

5.53 Due to the lack of information at the national level the regional distribution of village industries can not be discussed. Based on information presented in Chapter 2 we can only say that the existence of village industries is widespread. They are believed also to be a major source of income and employment of the rural households. Thus in the following discussion on industrial policy we shall address the issues involving both town and village industries.

The Planning Process at the National, Regional and Local Levels¹

5.54 The National Economic and Social Development Board (NESDB) is in principle the integrator of all industrial planning in the national and overall perspective. The unit directly responsible for this within the NESDB is the Industrial Planning Sector of the Economic Projects Division which also coordinates with other Divisions such as the Economic and Social Planning Division, the Development Studies Division, and the Population and Manpower Planning Division under the overall supervision of the NESDB Secretary-General.

5.55 The NESDB industrial planning process is a fairly sophisticated operation. Many of its own staff are highly trained professionals. Professional staff from the university community are also drawn upon to assist in the preparation of the plan draft. This draft is then discussed by an industrial plan committee composed of representatives of agencies involved in different capacities with the implementation of industrial policy, hence eminently interested in participating in its formulation. These include representatives of the following agencies and organizations:

- Ministry of Industry
- Ministry of Finance
- Ministry of Commerce
- Bank of Thailand
- Board of Investment
- Industrial Finance Corporation of Thailand
- Association of Thai Industries

5.56 The NESDB has regional offices in Chiang Mai for the North, Khon Kaen for the Northeast, and Songkhla for the South. The function of these offices is to monitor the implementation of current plans in their regions and provide information and feed back for their revisions and for the preparation of successor plans. They also provide technical assistance to changwat offices for the preparation of provincial plans.

5.57 Planning in the Ministry of Industry (MOI) is sectoral and industry specific. Overall planning within the broad industrial sector is handled by the Industrial Economics and Planning Division (Office of the Under-Secretary of State). This Division has Regional Industrial Economic Development Centers in the North, Northeast and the South. The capacity of these centers is severely limited by staff and budgetary constraints. This, combined with the fact that they have no line responsibilities,

¹ This section is taken mostly from Jacques Amyot, *Small Industrial Enterprise Supportive Institutions, A Preliminary Assessment*, Working Paper No. 29 of ROFEAP, Center For Applied Economics Research, Kasetsart University, January, 1981, and Jacques Amyot, *Northern Region Industrial Support Institute: Evaluation and Planning Perspectives*, Working Paper No. 30 of ROFEAP, Center for Applied Economics Research, Kasetsart University, June, 1981

leaves them with little first hand knowledge of the field. A much better source of information is the Changwat Industrial Offices whose officers are in constant contact with industry. Although their primary responsibility is to the Factory Control Division of the Department of Industrial Works, they also function as a liaison office of the MOI at the provincial level. Another source of information on industry at the local level is the Changwat Labor Offices of the Department of Labor.

5.58 Specific plans for small scale industrial enterprise, either factory or non-factory, are handled by the Planning Division of the MOI Department of Industrial Promotion (DIP), but this is done in collaboration with other units for the MOI as well. The text of the draft of the next plan for the development of home and small scale industry acknowledges the collaboration of the following:

- All units of the DIP
- Industrial Economics and Planning Division
- Industrial Economic Development Centers:
 - North, Northeast, South
- Changwat Industrial Office
- University faculty
- Private sector businessmen.

DIP units which are more directly geared to involvement in a planning exercise are the Industrial Service Divisions usually referred to as the Industrial Service Institutes (ISI) in Bangkok and Chiang Mai, as they have industrial development sections which conduct studies related to the potential of their region for industrial development and they are in contact with industrial entrepreneurs in their regions. This is also true to a lesser extent of the Management Development and Productivity Center which works closely with the ISI. The capacity of the ISI Institutes is well directed but weak because of personnel and budgetary constraints.

5.59 Planning is done at the local level in changwat offices which are required to formulate provincial development plans paralleling and following the guidelines of the National Plan. Some technical assistance is provided by the NESDB regional offices, as mentioned. Inputs are provided by the changwat officers of the various line agencies. Those more directly concerned with small scale industrial enterprise, besides the MOI, are the Community Development Department (CDD), the Office of Accelerated Rural Development (ARD), and, to a much lesser degree, the Public Welfare Department (PWD). The CDD does this more deliberately than the others through its regional Rural Development Offices. Proposals by the line agencies inevitably reflect their own work priorities established in Bangkok but all activity is directly under the jurisdiction of the provincial governors who in theory at least can accept or reject them at his discretion. As mentioned previously, these planning exercises are generally very weak for lack of a planning capacity at this level. Ability to act on the plan is also severely restricted because effective control over budgets and locally based line agency personnel has not in fact been transferred to provincial authorities. Any success in implementing locally conceived plans is due more to the leadership qualities of provincial authorities and their ability to obtain the collaboration of their colleagues on a personal basis than to provisions in the structure of local government to help bring this about.

Current Industrial Policy and Development Plans

5.60 The Fifth National Development Plan covers the period October 1981 – September 1986. The broad industrial development policy guidelines are as follows:

- Promotion of export oriented manufacturing.
- Rural industrialization.

Promotion of efficient import substitution industries
Energy conservation: switch from imported to locally developed sources of energy.
Protection of the environment and elimination of pollution.
More labor intensive industrialization.

5.61 A planning document of the MOI provides greater specification for the development of small scale industries. The objectives proposed are as follows:

Promote home industry and support it so that it can expand to the level of small scale industry.

Encourage and support the spread of small scale industries throughout the Kingdom by increasing their number, size, and variety of production.

The following types of industries will be supported: agro-industry, industry using local raw materials, industries producing exportable products, and industries producing light machinery.

5.62 There is a bias in favor of developing complementarities between agriculture and industry: industry producing agricultural tools and equipment and agriculture geared to the production of raw materials for industrial processing.

5.63 In another document, the DIP proposes a number of specific project activities to develop home and small scale industry:

(i) Projects to develop home industry

- Surveys on home industry production locations and markets.
- Develop appropriate technology and design.
- Training and logistic support for production.
- Revitalization of traditional artistic handicrafts.
- Financial assistance: loans, raw materials, equipment, purchase of output.
- Marketing assistance: increase number of handicraft stores, showrooms.

(ii) Projects to develop small scale industry

- Skill development for actual or prospective small-scale industry entrepreneurs.
- Feasibility studies for the establishment of upcountry small industries.
- Greatly increase Small Industry Finance Office (SIFO) capital for loans.
- Expand and multiply Industrial Service Institutes.
- Establish small enterprise industrial zones.
- Disseminate industrial technology.
- Develop small scale industries upcountry for local consumer needs.
- Promote pottery and ceramics industry: training centers.
- Develop furniture industry: improve technology and quality.
- Develop machine tool industry.
- Develop Thai silk industry.

Planning Data Sources

5.64 Government planners have several sources of information to draw on. Basic data are gathered by the National Statistics Office (NSO) which also conducts periodical surveys between census years. Industrial statistics and directories are compiled on an on-going basis by the various units of government dealing with industry which have their officers in all changwats. Already mentioned are the

Changwat Industrial and Labor Offices. Industrial surveys are also conducted by some of these e.g. the Department of Labor and the Industrial Service Institutes. Some analysis is done inhouse by the NESDB, the NSO, and the Bank of Thailand. This is also done by some of the larger banks such as the Bangkok Bank. The universities conduct considerable research bearing on industry. Some of their research conclusions are fed into the planning process but this resource is underexploited. While this data base is adequate for macro-planning purposes, its shortcomings become increasingly apparent the closer the planning gets to location and product specific considerations. Virtually all planners interviewed at all levels were unanimous in stating that their major handicap for effective industrial development planning was lack of information on the local and regional content of industrial development.

Industrial Development Policies and Rural Industrialization

5.65 Available statistics have been shown that the degree of rural industrialization is very low and has not been increasing. This is due partly to economic reason, and partly to government policies. Relative to Bangkok the rural areas have a much lower population density than Bangkok, and thus would have comparative advantage in the production of agriculture and other primary products. But the fact that the process of industrialization in rural areas has been very slow has to be explained by government policy or the lack of it.

5.66 The overall economic policies have been biased in favour of Bangkok, the consequence of which has been a much lower growth rate in rural areas. The policy bias is seen most clearly in the policy on infrastructure and agricultural output, and input, pricing. With a low growth rate, the rural areas lack effective demand to become a market big enough to attract manufacturing production.

5.67 Transportation cost has been a major element in preventing products from being manufactured close to sources of raw materials and market. Up until very recently transportation cost constituted a very small proportion of the cost of production and distribution. This has made it worthwhile to ship products and raw materials on a long distance to and from Bangkok.

5.68 Without manufacturing production entrepreneurship is very scarce in rural areas. Workers are also not suitable for factory works where regularity and continuity in attendance are necessary. Workers live in scattered areas. They also have seasonal employment opportunity, during which time they would prefer to work on the field and the farm.

5.69 Industrial development policies have not contributed towards the process of industrialization in rural areas. The emphasis has been on industries in urban areas. Investment promotion and protection policies have assisted import-substituting industries which rely more on the urban market for their products. The export promotion policy, while being very useful in creating employment, has attracted few industries into rural areas. And finally specific measures to promote rural industries have not been effective.

5.70 In the first place the designated promoted areas have not been able to attract investment because of inadequate infrastructure. The investment incentives provided are insignificant compared to the lack of infrastructure. Secondly credit assistance, which barely exists, can not be utilized unless there are entrepreneurs, who seek investment fund, who have viable project to back it up. Thirdly the lower minimum wage is irrelevant in promoting rural industries because workers are either not available during the planting and harvesting seasons, or available at a much lower than the minimum wage during the off season. Technical assistance is perhaps the only appropriate type of assistance provided to rural industries so far. The trouble is that there has been too little of it, and technical assistance alone is not sufficient.

5.71 It seems that to be effective the promotion scheme for rural industries has to be based on the basic characteristics of the rural areas. These are the availability of raw materials, the dispersed market, the lack of entrepreneurship, and seasonal nature of the labor supply. The rising cost of transportation will have a positive effect on the rural area, for it would encourage firms to locate their plants nearer to the source of raw materials and market. Technical assistance will have to be provided together with credit assistance. The rate of interest can be charged at the market-competitive rate. And the availability of the labor force very much determine the type of industries which can be located in rural areas. Agro-based industries are obvious candidates. The cottage industries which are very small and do not require expensive machinery which has to be kept running most of the time are also obvious candidates. This type of industries requires a comprehensive promotion scheme ranging from credit, operation, and marketing. And finally the labor intensive industries can only be profitably set up in the area near the town centers. The promotion of such industries has to be linked to export promotion policy. In this case it would also require a reduction in policy bias in favour of Bangkok.

C. DONOR SUPPORT FOR RURAL INCOME AND EMPLOYMENT

5.72 Foreign assistance in the form of grant and specifically for rural industries and employment promotion has been very limited. The international Labor Office, through the program "Asian Regional Training and Employment Program (ARTEP)" has been supporting a series of research and training activities aimed at promoting employment in Thailand. As of 1981 ARTEP has organized 7 core projects for employment promotion program in Thailand. And these core projects are sub-divided into 14 projects. (As shown in Table 5.2) ARTEP activities cover various aspects from survey and studies to training and seminar. The pertinent issues extensively analyzed and examined are labor market situation in rural areas and the changes taking place, interrelationship between agriculture and industry and its impact on resource mobilization for employment generation, and rural employment planning and policy.

5.73 It is noted that ARTEP activities are concentrated in research, training and seminar, rather than the project-type activities that create or affect employment directly. The project-type foreign assistance has contributed to the establishment of the ISI and the TMPDC as discussed earlier. These two organizations have benefited from the assistance of UNDP, UNIDO, APO, etc., which has been continuing although the amount of contribution has been declining.

5.74 Apart from the major programs described above Thailand has received some assistance from foreign countries on a bilateral basis. In 1981 there were two project which were designed to promote rural employment.

5.75 The source of assistance was Japan and the implementing agency was Ministry of Industry. The first project, amounted to US\$ 65,835, was to assist the Department of Industrial Promotion to develop the labor intensive bamboo industry, which was usually located outside Bangkok. The second project was to help Ministry of Industry establish Industrial Development Centre for Furniture. The amount of assistance was US\$ 44,320.

5.76 It is clear that in the past donor countries and agencies did not pay much attention to the programs and projects on rural off-farm employment, either directly or through the promotion of rural small scale and cottage industries. But more recently there has been an increasing interest shown by several agencies and countries. The World Bank launched a major research project on off-farm employ-

Table 5.2 : ON-GOING AND COMPLETED ARTEP ACTIVITIES IN THAILAND IN 1981

Core Project	Sub-divided Project
Project A: Rural Employment Promotion in Asia	<ol style="list-style-type: none"> 1. Labor Absorption in Thai Agriculture 2. Sugar cane Cultivation 3. Irrigation and Water Management in Northern Thailand 4. Mechanization in Agriculture and its Impact on Employment 5. Rural Hired Labor
Project B: Industry, Trade and Employment	6. The Development of Small Scale Industries and Rural Industrialization
Project C: Local Resource Mobilization for Employment Generation	7. Survey Work Started in Thailand
Project D: Labor Markets and Employment Policies	8. The Extent of Landlessness and the Factors That Cause the Increasing Drift Towards Landlessness
Project E: Monitoring and Evaluation of Trends in Employment, Income Distribution, Poverty, and the Satisfaction of Basic Needs	9. Work on the Preparation of A Monograph Trends in Rural Poverty
Project F: Technical Assistance for the Planning of Employment and Income Distribution	<ol style="list-style-type: none"> 10. Tripartite Seminar on Employment and Wages Policies 11. Basic Needs and Minimum Wages 12. The Preparations for Organizing A National Household Survey in 1982 13. Employment Generation in Urban Slums
Project G: Training in Employment Projections and Planning	14. Training Course on the Role of Credits in Promoting Self-Employment in the Rural Off-Farm Sector

ment in 1981¹, with a view to developing a program on rural employment promotion in agriculture and industry. Studies on small scale industries and credit guarantee scheme were supported by the World Bank in 1982². UNIDO launched in early 1983 an industrial investment promotion project in the Northeast with the objective of initiating investment in small scale industry³. Furthermore there has been assistance from Japan on the financial aspect of small scale industries, from the Netherlands on how to make the Department of Industrial Promotion serve small scale industries better, and from Germany on management training for small firms.

5.77 The established trend is that more and more donor countries and agencies are showing interest in the program to promote rural industries and hence rural employment. The difficulty lies more with the lack of appropriate receiving system and institutions on the Thai side. The two major responsible institutions, i.e. DIP and CDD, are not adequately organized for the task. As discussed earlier, the main reason is that RTG has only recently decided to accord a high priority to rural industries and has been in the process of setting up an effective promotion program and organizing the various agencies for its implementation.

D. CONCLUSION

5.78 Current RTG policy and its trends show that regional and rural development are accorded an increasing degree of significance in the overall national development scheme, which should have a favorable effect on rural income and employment. But because of the center periphery problem, RTG efforts at the promotion of rural income and employment have yielded small result relative to the magnitude of the problem.

5.79 The industrial policy has been changing its orientation towards rural industry. The existing locational bias in favor of Bangkok is, however, so strong that rural industrialization program continues to face an up-hill struggle. Most importantly RTG still lacks an effective promotional program, as well as appropriate institutional infrastructure to implement the program.

5.80 Foreign assistance in this area has been limited, due largely to the fact that RTG has not as of now shown its readiness to effectively utilize the assistance.

¹ See the discussion derived from World Bank studies, in Chapter 6, this volume.

² Narongchai Akrasanee and Associates, *Small and Medium Industries in Thailand*, Report prepared for the World Bank, 1983, Narongchai Akrasanee and Associates, *A Study of Industrial Credit Guarantee scheme in Thailand*, Report prepared for the World Bank, January, 1983.

³ UNIDO, "Pilot Project for Industrial Expansion in the Northeast", *United Nations Development Programme Project of the Government of Thailand*, No. THA/82/010/A/01/37, December 28, 1982.

Chapter 6

Development of Rural Economy

by
Jamlong Atikul

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DEVELOPMENT OF RURAL ECONOMY

6.01 This chapter provides an overview of overall macro economic aspects of the rural economy of Thailand. Its emphasis is to demonstrate the importance of rural non-farm and off-farm activities as sources of income and employment of the rural sector. Agricultural and non-agricultural activities are examined as integral parts of the system. Then linkages of the rural economy with the national and to some extent world economic system are discussed. Advantages of distributing benefits of growth to wider economic activities, wider scales, wider space and wider population are also considered. The chapter then concludes with a policy guideline and a discussion of project or program issues that have emerged from the analysis of this paper.

6.02 As is the case in the previous chapters, the analysis presented here is also based on the ROFEAP results supplemented by other secondary data and materials.

A. THE RURAL ECONOMY AS AN INTEGRATED SYSTEM OF AGRICULTURAL AND NON-AGRICULTURAL ACTIVITIES

6.03 It is a general impression that the rural households engage primarily, if not solely in agriculture. The ROFEAP shows that though the rural sector of Thailand is basically agriculture-based, the non-farm activities also form a significant integral part. That is farm households in the study areas¹ earn considerable amount of incomes from non-farm enterprises as well.

Extent and Nature of Rural Activities

6.04 Results from a rural household survey² show that few households earn their income largely from farm enterprises. Out of 25 sample villages, 11 derived the largest share of household income from farm enterprises, 6 from non-farm enterprises, 6 from wages (off-farm employment), and 2 from other sources. Of the total net household income reported in all villages, about 35 percent was from farm activities, 21 percent from non-farm activities, 28 percent from wages and 15 percent from other sources. That is nearly two-thirds of total income earned came from sources other than direct farm activities.

6.05 The significance of the non-farm income sources is further illustrated by the result of the same survey that "4 of the 7 villages below the poverty line earned the largest share of income from farm activities compared to 7 out of 18 for those above the poverty line." Furthermore, income from farm activities usually generates a seasonal pattern according to the crop calendar of the principal crops. There appears to be several instances in which income earned from other sources so complements the

¹ The study areas covered in the ROFEAP are Khon Kaen, Roi Et, Chiang Mai and Suphan Buri.

² Yongyuth Chalamwong and Richard L. Meyer, *Farm Household Income Levels, Sources and Patterns in Selected Thai Village*, Research Paper No. 14 of ROFEAP, Center for Applied Economics Research, Kasetsart University, August, 1982.

pattern of net farm income received that the variability of total household income is less than that of net farm income.

6.06 Most households engage in one or two farm enterprises. In Khon Kaen the highest values of production and sales are from sugar-cane, jute and kenaf, livestock and poultry and rice. Roi Et has fewer farm enterprises; farm households mainly engage in the production of rice, fruit and livestock. Chiang Mai produces fruit, rice, livestock and poultry and some upland crops. Suphan Buri has fewest farm activities, producing mainly rice, livestock and vegetables. (See Table 6.1).

Table 6.1 : AVERAGE VALUE OF PRODUCTION AND SALES¹, FARM ENTERPRISES, 1980-81.

(Baht)

Farm Enterprises	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri	
	Pro-duction	Sale	Pro-duction	Sale	Pro-duction	Sale	Pro-duction	Sale
Rice	8,415	5,480	10,720	3,439	11,055	7,974	24,110	34,393
Kenaf & Jute	8,755	7,953	1,804	1,729	-	-	-	-
Sugar cane	55,424	55,424	-	-	-	-	-	-
Cassava	3,474	3,732	-	-	-	-	-	-
Other upland crops	732	324	1,131	2,376	5,817	4,702	289	1,326
Fruit	980	975	3,940	4,680	12,304	12,304	894	2,196
Vegetables	1,112	888	100	100	1,872	1,433	2,159	12,840
Livestock & Poultry	7,625	16,101	10,228	3,021	6,514	5,350	50,967	19,779
Fish & Shrimp	213	616	565	259	n.a.	146	250	274
Others	879	1,694	26	141	942	854	241	189

¹ Sales may exceed production value due to different number of households interviewed.

Source: Compute from Richard L. Meyer and Adelaida P. Alichusan, *Farm Household Heterogeneity and Financial Needs* Research Paper No. 17 of ROFEAF, Kasetsart University, August, 1982, Tables 6-9.

6.07 More than half of rural households have one or more non-farm enterprises in addition to their farm enterprises. Major activities in Khon Kaen are commerce, services and pottery. Rural households in Roi Et engage in activities like commerce, hand tools, wood products and ox-carts. Activities which bring highest income to rural households in Chiang Mai are wood products, noodles, commerce, pottery, bricks and hand tools. Surprisingly, rural households in Suphan Buri do not have significant income from non-farm enterprises. (See Table 6.2).

Table 6.2 : AVERAGE VALUE OF PRODUCTION AND SALES¹ NON-FARM ENTERPRISES, 1980-81.

(Baht)

Non-Farm Enterprises	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri	
	Pro-duction	Sale	Pro-duction	Sale	Pro-duction	Sale	Pro-duction	Sale
Noodles	1,356	1,835	8,382	8,382	51,621	52,128	-	-
Ox-carts	-	-	13,492	11,801	-	-	-	-
Silk	1,930	11,754	144	100	-	-	-	-
Cotton	270	695	246	580	288	356	-	-
Wood products	694	735	10,325	993	177,075	169,740	630	-
Bamboo products	1,067	2,171	6,590	6,978	6,234	6,585	88	80
Mats	1,427	1,335	77	n.a.	-	-	-	-
Pottery	14,369	10,561	-	-	16,044	14,373	-	-
Bricks	-	-	-	-	16,510	12,818	-	-
Hand tools	6,226	9,208	12,495	12,225	10,792	12,092	-	-
Processing products	833	618	-	240	9,346	10,203	265	247
Cement products	2,500	2,000	-	-	-	-	-	-
Lacquerware	-	-	-	-	106	2,453	-	-
Commerce	128,369	128,369	16,486	16,486	22,744	22,744	2,724	2,724
Service	15,894	15,894	3,230	3,230	2,389	2,389	-	-
Others	822	1,947	3,850	3,850	189,260	170,201	363	211

¹ Sales may exceed production due to different number of households interviewed.

Source: Computed from Richard L. Meyer and Adelaida P. Alicibusan, *Farm Household Heterogeneity and Financial Needs*, op.cit., Tables 10-13.

6.08 The above describes the nature of agricultural and non-agricultural activities taking place in the rural sector. Table 6.3 further shows the extent of relationships of these activities. Except in Suphan Buri, rural households in all areas earn proportionally more from non-farm activities than from farm enterprises. The dependence on non-farm income is highest in Chiang Mai where non-farm income earned per farm household is almost 90 percent of total income. Suphan Buri, on the other hand, has more farm income than non-farm or off-farm income.

Table 6.3 : COMPOSITION OF NET FAMILY INCOME PER FARM 1980-81

Type of Income	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
1. Net Farm Income	23,969	40.25	6,646	21.65	6,478	10.10	28,437	65.41
Cash	19,158		2,342		3,327		27,885	
Non-cash	4,811		4,304		3,151		552	
2. Net Non-farm Income	35,577	59.75	24,053	78.35	57,667	89.90	15,036	34.59
Cash	19,282		12,011		39,185		-1,199	
Non-cash	1,908		936		95		89	
Wages & Salaries	6,526	18.34	5,511	17.95	11,454	17.86	12,709	29.23
Rental	-39		79		387		-340	
Small Business	3,878		167		4,136		13	
Transfer	127		1,142		57		-169	
Miscellaneous	2,441		2,615		1,446		1,194	
Changes in inventories	1,454		1,592		907		2,739	
3. Net Family Income	59,546	100.0	30,699	100.00	64,145	100.00	43,473	100.00

Source: Yongyuth Chalamwong, A Descriptive Analysis of Wealth Income and Credit in Rural Thailand, Conference Paper No. 4 of ROFEAP, Kasetsart University, Tables 4-7.

6.09 Situations at regional and national levels further amplify the importance of rural off-farm activities and their integration with agricultural or farm production. Table 6.4 presents a breakdown of farm income and total off-farm income for municipal areas, sanitary districts and villages in 1975/76. Total off-farm income accounted for nearly half of total household income at the village level and it was 74 percent at the sanitary districts. The agricultural off-farm incomes were only 9.5 percent and 6.2 percent respectively for village and sanitary district levels. That is non-agricultural income is more important than agricultural off-farm income for rural households. Even for farm households in the villages and sanitary districts, farm income accounted only 50-60 percent of total income.

6.10 Regional data on farm and off-farm incomes for farm households presented in Table 6.5 confirm the above description. For the whole country, the non-agricultural off-farm income accounted for 34.7 percent whereas agricultural off-farm was 8.6 percent of total income. From rough estimates of regional growth rates of various income components that exist (Table 6.6) it can be seen that regional non-agricultural employment and GDP outstripped those of agricultural sources. This is true for every region. Furthermore, total off-farm income has also grown at higher rates than agricultural income.

Table 6.4 : EXTENT OF RURAL NON-FARM ACTIVITIES, THAILAND, 1975-76

Type of Household	Farm	Non-farm	Total	Farm	Non-farm	Total	Farm	Non-farm	Total
Distribution of Households by Type (Percent)	4.63	95.37	100.00	52.65	47.35	100.00	82.71	17.29	100.00
Total Household Income	42,769	41,848	41,891	25,019	29,993	27,377	17,661	19,644	18,004
Distribution of Household Income by Source (Percent)									
Farm Income	29.54	1.73	3.04	50.47	3.36	26.01	61.53	8.31	51.48
Total Off-Farm Income	70.46	98.27	96.96	49.53	96.64	73.99	38.47	91.69	48.52
Agricultural Off-Farm Income	2.33	2.09	2.11	8.12	4.36	6.17	9.06	11.63	9.54
Nonagricultural Income	68.13	96.18	94.85	41.41	92.28	67.83	29.41	80.07	38.97

Source: World Bank, *Growth and Employment in Rural Thailand*, Report No. 3705a-TH, May 1983- Table 2.1.

**Table 6.5 : FARM AND OFF-FARM INCOMES FOR FARM HOUSEHOLDS, BY REGION, THAILAND, 1978/79
BAHT/FARM HOUSEHOLD**

SES 1975/76 Region	Total ² Income	Farm ² Income	Off-Farm Income			(Percent) Off-Farm Income as Proportion of Total Income		
			Total	Agricultural ³ Off-Farm	Nonagricul. Off-Farm	Total	Agricultural Off-Farm	Nonagricul. Off-Farm
North-Upper	14,021	6,914	7,107	1,380	5,727	50.7	9.8	40.9
North-Lower	24,757	17,011	7,746	3,090	4,656	31.3	12.5	18.8
Northeast-Upper	15,129	8,131	6,998	951	6,047	46.3	6.3	40.0
Northeast-Lower	15,317	9,382	5,935	861	5,074	38.7	5.6	33.1
Center-West	24,189	12,164	12,025	2,764	9,261	49.7	11.4	38.3
Center-Middle	25,402	13,643	11,759	1,751	10,008	46.3	6.9	39.4
Center-East	31,968	18,571	13,397	3,078	10,319	41.9	9.6	32.3
South-Upper	23,889	12,380	11,510	1,797	9,713	48.2	7.5	40.7
South-Lower	21,761	11,002	10,759	2,629	8,130	49.4	12.1	37.4
Greater Bangkok ¹	31,131	18,704	12,428	903	11,525	39.9	2.9	37.0
Whole Kingdom	19,478	11,049	8,429	1,671	6,758	43.3	8.6	34.7

¹ Greater Bangkok = Bangkok-Thonburi, Nonthaburi, Pathumithani, Samutprakarn.

² Total Income = [(average cash income from agri. + value of home consumption) - cash expenses for agriculture] + average cash total off-farm income. Farm Income = [(average cash income from agri. + value of home consumption) - cash expenses for agriculture].

³ Agricultural Off-Farm = hiring out animals; hiring out farm equipment; hiring out farm workers; renting out land or living quarters.

Source: World Bank, *Growth and Employment in Rural Thailand*, op.cit., page 46.

Table 6.6 : GROWTH OF NONFARM INCOMES OF AGRICULTURAL ENTERPRISE HOUSEHOLDS, GDP AND EMPLOYMENT, THAILAND

	Regional Employment		Real Regional GDP		Total Household Income	Off-Farm Income			Agri. Sales	Agri. Expense
	Nonagri.	Agricultural	Total	Agricultural		Total	Agricultural	Nonagri.		
In 1978/79 baht					19478	8429	1671	6758	14901	7826
1978/79 as percent of Total Income					100.0	43.3	8.6	34.7		
<u>Annual Compound Real Growth Rates 1971/72 – 1978/79¹</u>										
					Percent					
Whole Kingdom			7.8	7.2		12.3			8.7	9.0
North	9.6	1.4	6.0	5.4		11.7			8.7	5.4
Northeast	3.5	3.6	6.7	5.5		12.6			4.6	4.2
Center	5.8	3.6	8.1	8.6		10.7			7.7	12.6
South	9.6	1.9	9.7	9.4		13.0			10.5	4.1

¹GDP and employment growth rates relate to 1971–1978.

Source: World Bank, *Growth and Employment in Rural Thailand*, op.cit., page 28.

Linkages of Agricultural and Non-agricultural Activities

6.11 As agricultural and non-agricultural activities form an integral part of the rural economy, the development of the latter depends on the interrelationships with the former. These linkages are important consideration for expansion of rural income and employment. They can be analyzed in various ways. However, the discussion here is limited to (a) the agricultural outputs and their linkages to non-farm activities, (b) agricultural input requirements of non-farm activities and (c) rural consumer demand.

(a) Agricultural/Outputs

6.12 The major crops and other farm outputs produced in the area covered by the ROFEAP are rice, kenaf and jute, sugarcane, cassava, other upland crops, fruit, vegetables, livestock and poultry, fish and shrimp and other farm products. These agricultural outputs have considerable potential for generating employment through forward linkages in the processing industries. Paddy rice has to go through threshing and milling. Cassava processing consists of chipping, pelletizing or starch production. Jute and kenaf, on the other hand, require on-farm processing, however; whereas in the case of sugarcane, labor is required more in cutting and transport than in processing. Fruit and vegetables also offer potential in processing such as canning.

6.13 Examination of rural non-farm activities reveals the following enterprises: noodles, ox-carts, silk, cotton, wood products, bamboo products, mats, pottery, bricks, hand tools, processing agricultural products, cement products, lacquerware, commerce, service and other products. Little relationship between agricultural and non-agricultural activities can be discussed from the ROFEAP data. However, these linkage potentials exist and need to be further exploited.

(b) Agricultural Inputs

6.14 Agricultural inputs that have substantial impact on rural employment are mechanical inputs and animal feeds. Fertilizers and pesticides, on the other hand, are imported or produced in urban-based factories. These inputs are however not covered by the ROFEAP¹. According to a World Bank report², the agricultural mechanization process in Thailand has been demand driven. And there is as yet little reason to be concerned about its agricultural employment (substitution) implications. The non-agricultural employment implications of mechanizations are not very large. The animal feed industry situation is similar with respect to employment generation³. That is it cannot yet be expected to provide substantial non-farm employment opportunities to rural households.

(c) Consumer Demand

6.15 Rural consumption patterns have been observed for both households in rainfed areas and in irrigated areas⁴. Cash and computed expenditures made by average households by type and farm size, excluding however farm production and non-farm expenses are reported in Table 6.7.

¹ See World Bank, *Growth and Employment in Rural Thailand op.cit.*, on which this section is based, for a fuller discussion.

² World Bank, *Growth and Employment in Rural Thailand, Ibid.*, p. 69.

³ World Bank, *Growth and Employment in Rural Thailand, Ibid.*, p. 74.

⁴ Somsak Priebprom, *The Role of Farm, Non-farm Enterprises and Off-Farm Work in Household Employment and Income Generation on Irrigated and Rainfed Farms, Khon Kaen, Thailand, Research Paper No. 7 of ROFEAP. Center for Applied Economics Research, Kasetsart University, July, 1982.*

Table 6.7 : AVERAGE HOUSEHOLD EXPENDITURES BY TYPES AND FARM SIZE GROUP OF RAINFED AND IRRIGATED FARMS

(Unit : Baht per Household)

	Rainfed Farm								Irrigated Farm							
	Small		Medium		Large		All Farms		Small		Medium		Large		All Farms	
	Amount (baht)	Percent	Amount (baht)	Percent	Amount (baht)	Percent	Amount (baht)	Percent	Amount (baht)	Percent	Amount (baht)	Percent	Amount (baht)	Percent	Amount (baht)	Percent
Food Expenditure:	7,765	71.4	7,040	59.4	8,734	57.7	7,660	61.6	8,076	61.9	7,013	50.6	7,348	49.2	7,380	53.0
Rice	5,392	49.6	5,023	42.4	6,315	41.7	5,449	43.8	5,122	39.3	5,138	37.0	5,052	33.8	5,111	36.7
Other Food	2,373	21.8	2,017	17.0	2,419	16.0	2,211	17.8	2,954	22.6	1,875	13.5	2,296	15.4	2,269	16.3
Non-Food Expenditure:	3,103	28.6	4,814	40.6	6,395	42.3	4,780	38.4	4,973	38.1	6,857	49.4	7,578	50.8	6,548	47.0
Clothing	688	6.3	914	7.7	1,127	7.5	951	7.6	1,030	7.9	1,062	7.7	1,237	8.3	1,099	7.8
Medical	375	3.5	1,196	10.0	1,059	7.0	992	8.0	1,356	10.4	1,142	8.2	757	5.1	1,097	7.9
Education	187	1.7	360	3.0	939	6.2	505	4.1	332	2.5	2,253	16.2	2,999	20.1	1,943	14.0
Charity	405	3.7	796	6.7	633	4.2	697	5.6	755	5.8	577	4.2	568	3.8	621	4.5
Entertainment	529	4.9	594	5.0	1,035	6.8	671	5.4	755	5.8	875	6.3	893	6.0	848	6.1
General*	574	5.3	452	3.8	546	3.6	547	4.4	426	3.3	312	2.2	393	2.6	363	2.6
Other	345	3.2	502	4.2	1,056	7.0	417	3.3	319	2.4	636	4.6	737	4.9	577	4.1
TOTAL	10,868	100.0	12,020	100.0	15,129	100.0	12,400	100.0	13,049	100.0	13,870	100.0	14,926	100.0	13,928	100.0

* Electricity tax, housing maintenance.

Source: Somsak Priebprom, *The Role of Farm, Non farm Enterprises and Off-Farm Work in Household Employment and Income Generation on Irrigated and Rainfed Farms, Khon Kaen, Thailand, op.cit., Table 18.*

6.16 Food expenditures account for more than 50 percent of the total family consumption expenditures for the total farm sample. Rice is the single most important item accounting for 44 and 37 percent of total family consumption for the rainfed and irrigated farms, respectively. Higher relative expenditure on rice and for that matter on food items can be explained by the fact that on the average the rainfed farm households have relatively lower income than the irrigated and therefore have to spend a larger proportion of their income on food. The values of food expenditures as a proportion of total expenditures for both rainfed and irrigated farms tend to decrease as the farm size increases.

6.17 Household non-food expenditures in both relative and absolute terms are lower for the rainfed than for the irrigated farms and increase with the farm size, reflecting higher income levels of the latter group. The patterns of allocation of family budgets on non-food expenditures are similar for both rainfed and irrigated farm families with the exception of education. The irrigated farm families tend to expend higher percentage of their income on education than rainfed farm families.

6.18 Rural household consumption expenditures tend to vary from month to month. However, the food expenditures are relatively stable for both rainfed and irrigated farm households. It is the non-food expenditure items that vary from month to month. The variation is explained by the relation of expenditure to the income flow of households and the degree of household participation in various local religious and social events which occur at different points of time.

6.19 The above discussion indicates that there exists potential linkages between agricultural outputs and non-farm employment on the one hand and between agricultural input requirements on non-farm employment on the other. Rural consumer demand has also shown considerable impact on farm outputs. Another important factor that has potential influence on the farm and non-farm outputs especially their growth and substitutions is the urban consumer demand¹. It is the area that has yet to be explored, however. At present it is not yet possible to infer their exact relationship.

Supply Factors

6.20 The linkages of the agricultural and nonagricultural activities in the rural economy depend to a large extent on the availability of supply factors and the constraints created by them on one another².

(a) Labor Force Participation and Potential Labor

6.21 In Thailand, male and female labor are equally important in agricultural production in terms of planting, seeding, taking care of crops, harvesting and threshing. During off-peak periods, females can contribute more to household's work and other business and men in non-farm or off-farm work.

6.22 The ROFEAP³ reports potential labor supply among various farm sizes.⁴ The potential labor is defined as the number of members of the family aged 15–65 who work during the survey year in

¹ Some preliminary examination is available in World Bank, *Growth and Employment in Rural Thailand*, *op.cit.*, pp. 75–88.

² This section discusses labor and land factors while capital is discussed in the next section and only in the context of credit availability. Questions on skills are left to chapters on village and town industry.

³ Yongyuth Chalamwong, *An Analysis of Household Labor Supply for Off-Farm Enterprises*, Conference Paper No. 13 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981.

⁴ Households are classified into (a) the landless, renting or owning no piece of land, (b) small farmer operating land ranging from 0.1 rai to 9.99 rai, (c) medium farmer cultivating land ranging from 10 to 24.99 rai and (d) large farmer with more than 25 rai of land.

income generating activities. The potential labor force for the landless household averages 2.73 persons per household, 3.15 persons for small farm size, 3.87 persons for medium farm size and 4.57 persons for large farm size. Adding children who were reported to work the corresponding figures become 3.16, 3.62, 4.64 and 5.31, respectively.¹ As the average number of family members increase with the farm size (4.17 for the landless households, 4.39 for small farmers, 5.49 for medium farmers and 6.53 for large farmer) the corresponding ratios of working members to total members of the family are 75.8, 82.5, 84.5 and 81.3, respectively.

6.23 The potential labor force can be importantly compared with those actually working during the peak periods. The proportions of potential labor force actually working during peak periods are reported to be 83.4, 95.2, 88.6 and 90.8 for the above respective groups. The corresponding ratios for male alone for all groups are higher than those of female. The above figures indicate that substantial amount of labor can be forthcoming as demand arises.

(b) Labor Utilization

6.24 The labor utilization situation again in the areas covered by the ROFEAP is reported in Table 6.8. Khon Kaen is shown to have highest male labor utilization and Chiang Mai female labor utilization. Suphan Buri has lowest male and female labor utilization. All provinces except Chiang Mai have most of labor employed in farm enterprises. Chiang Mai itself has highest employment in off-farm activities.

Table 6.8 : AVERAGE NUMBER OF WORKING DAYS PER WORKING FAMILY MEMBER IN PROVINCES, 1980-1981.

Province	Male				Female			
	Farm	Non-Farm	Off-Farm	Total	Farm	Non-Farm	Off-Farm	Total
Khon Kaen	135.8	24.8	64.4	225.0	105.3	53.8	29.3	188.4
Roi Et	90.5	81.9	29.2	201.6	98.6	53.0	12.1	163.7
Chiang Mai	62.6	64.0	93.2	219.8	46.3	76.4	99.9	222.6
Suphan Buri	92.3	13.3	39.6	145.2	81.5	15.0	22.2	118.7

Source: Youngyuth Chalamwong, *An Analysis of Household Labor Supply for Off-Farm Enterprises, op.cit.*, Tables 4-7.

(c) Seasonality of Labor Use

6.25 Demand for labor fluctuate through out the year depending mainly on agricultural production requirements. Khon Kaen tends to have a higher average number of work days for farm activities during the wet season (May through December) both for males and females. The peak employment is reached during the rice planting month (July) and harvesting month (December). The labor used on

¹Called economically active.

farm is still more than in non-farm and off-farm activities. A similar pattern of labor utilization is observed in Roi Et.

6.26 In Chiang Mai, peak employment is reached in July for planting and again in December for harvesting. More time is spent on off-farm and non-farm activities. The total time spent on all activities ranges from 15.5 days to 23.7 days for males and from 16.4 days to 22.4 days for female. The situation in Suphan Buri is different from the other three provinces. The average number of working days per working member is relatively smaller. On the average, only 9.4 days to 19.8 days of male family labor are used and 7.1 to 19.0 days of female are used. The peak demand for labor is observed only in the month of December. There is no single month in which family labor is utilized up to the peak level in other provinces. Farm is the dominant enterprise in the province.

(d) Regional Labor Utilization

6.27 Regional rural labor markets also display similar labor utilization patterns to those found in the ROFEAP areas. As Table 6.9 shows, total nonmunicipal (rural) employment in 1979 fluctuated from 14 million persons in slack season to 18.4 million persons in peak season, a swing of 4.4 million persons. In terms of agricultural labor utilization, the number increased from 9.6 million persons to 14.9 million persons, an even greater increase of 5.3 million persons. The seasonal fluctuation of agricultural employment is most pronounced in the Northeast and the North. In absolute terms, agricultural employment in the Northeast shifted from 3.5 million persons to 6.7 million persons and the North from 2.5 million persons to 3.8 million persons respectively from slack to peak seasons. The seasonal increases in employment in the two regions amount to nearly the same level of slack season employment level or half that level.

Table 6.9 : SECTORAL DISTRIBUTION OF SLACK AND PEAK SEASON EMPLOYMENT IN NON-MUNICIPAL AREAS, BY REGION, THAILAND, 1979.

	North		Northeast		Center ¹		South		Whole Kingdom ²	
	Slack	Peak	Slack	Peak	Slack	Peak	Slack	Peak	Slack	Peak
Agriculture	71.8	84.7	75.8	91.6	57.7	66.2	71.4	75.4	68.5	81.2
Mining and manufacturing	9.1	3.9	8.5	1.9	16.7	13.0	10.6	8.3	11.4	6.1
Construction	2.9	1.4	2.8	0.6	3.9	2.8	3.4	2.3	3.3	1.6
Commerce	8.0	4.6	5.5	2.4	8.7	7.1	6.9	6.6	7.2	4.6
Services	6.6	1.0	5.9	2.9	9.7	8.4	5.6	5.5	7.3	5.1
Utilities and transportation	1.7	4.3	1.6	0.6	3.3	2.5	2.2	2.0	2.2	1.4
Total percent	100	100	100	100	100	100	100	100	100	100
(000's)	3431	4541	4613	7328	3329	3759	2158	2222	14013	18358

¹ Center excludes Bangkok-Thonburi.

² Whole Kingdom includes Bangkok-Thonburi.

Source: World Bank, *Growth and Employment in Rural Thailand*, op.cit., Table 5.1.

6.28 The increase in seasonal employment in agriculture was in fact drawn from the decrease in nonagricultural employment and activities. However, as shown in Table 6.10, the major source of these seasonal labor was changing the labor force. That is additional people classified as "waiting for agricultural season" and those performing housework are drawn into this expanded labor force as demand arises. However, these data indicate the linkages between the agricultural and nonagricultural sectors and the responsiveness of rural labor to demand.

Table 6.10 : SEASONAL EMPLOYMENT CHANGES IN NONMUNICIPAL AREAS BY SECTOR, STATUS, AND REGION, THAILAND, JANUARY–MARCH AND JULY–SEPTEMBER, 1979

	North	Northeast	Center ¹	South	Whole Kingdom ²
	(Percent of change in agriculture employment)				
Agriculture	100.0	100.0	100.0	100.0	100.0
of which: unpaid family workers	(86.3)	(94.7)	(95.5)	(103.9)	(92.7)
Nonagriculture	-19.7	-15.7	-24.4	-52.1	-18.2
Mining & Manufacturing	- 9.5	- 7.8	-12.2	-32.3	- 9.2
Construction	- 2.6	- 2.7	- 4.7	-16.3	- 3.2
Commerce	- 4.7	- 2.6	- 3.8	- 2.5	- 3.1
Services	- 2.0	- 1.8	- 1.0	1.1	- 1.6
Utilities & Transportation	- 0.9	- 0.9	- 2.8	- 2.2	- 1.0
Unemployed	- 0.7	- 0.6	- 0.4	-	- 0.6
Outside the Labor Force	-75.4	-80.3	-66.4	-23.3	-76.1
Housework	- 7.0	- 6.1	- 5.3	- 9.5	- 6.6
Waiting for agricultural season	-67.9	-71.8	-62.2	-26.4	-68.6
Students and others	- 0.6	- 2.4	1.0	12.7	- 1.0

¹ Center excludes Bangkok–Thonburi.

² Whole Kingdom includes Bangkok–Thonburi.

Source: World Bank, *Growth and Employment in Rural Thailand*, op.cit., page 93.

Land Use

6.29 Land is one of the most important factors contributing to agricultural growth. It is also a major constraint. Therefore, land availability needs to be examined in order to assess the potential growth of agriculture.

(a) Land under Cultivation

6.30 Land under cultivation in the study area varies from province to province. The modal size farm is 15.0–19.99 rai in Khon Kaen, 0.1–4.99 rai and 10.0–14.99 rai in Roi Et, 0.1–4.99 rai in Chiang Mai and more than 50 rai in Suphan Buri. That is farm sizes tend to be smallest in Chiang Mai

largest in Suphan Buri with Khon Kaen and Roi Et in Between (See Table 6.11). There is a large proportion of landless households in Chiang Mai (28.7 percent). Lower ratios are reported in Roi Et and Khon Kaen while there are no landless households in Suphan Buri.

6.31 In terms of ownership, only 41 percent of farmers own all of the land they cultivated. About one-third are tenants and 13 percent of them own part of the land and rent the rest. The highest rate of tenancy is reported in Chiang Mai (50 percent) and lowest in Khon Kaen (12.8 percent). (See Table 6.12).

(b) Land Utilization

6.32 Farmers in all areas use almost all their land in cultivation during the wet season, insignificant amounts of land are left idle. (Table 6.13). However, less than one-fifth of land is used for cultivation in the dry season except Chiang Mai which uses nearly 70 percent of their land for such purposes.

6.33 Reasons for low level of land utilization during the dry season are related to the availability of water. Table 6.14 shows that less than one-fourth of all areas is irrigated all year round. The rest is highly rain dependent. This is particularly true for Roi Et and Khon Kaen. Therefore, most of the area is engaged in rainfed agriculture with low level of land utilization.

6.34 The lack of water in the cultivated land in the study areas is, to some extent, influenced by the nature of their land holdings. More than half of households (57 percent) operate between 2 to 3 plots of land. About 15 percent cultivate up to 4-5 plots. Only 34 percent of households hold a single plot for cultivation. This pattern of land fragmentation presents a problem of water distribution to the farm land.

(c) Land Availability Prospects

6.35 The above analyses indicates that expansion in agricultural production could be possible at least in the ROFEAP areas through higher intensity of land use. This is consistent with previous recommendations at the national level that future agricultural growth would have to depend almost exclusively on yield increases. Previous estimates¹ project that land suitable for agriculture in all regions except the South would be exhausted by 1980 and 1981.

6.36 A more recent estimate,² however, suggests that in fact more land would be available especially for cropland expansion in the 1980s.

6.37 Based on this new information, it is estimated by the World Bank³ that between 15 percent and 36 percent of the land suitable for agricultural use is presently not cultivated and that cropland could expand by between 26 and 62 million rai. However, it also warns of obstacles to the realization of such potential thus: "Difficult accessibility and security risks in the area suitable for (but not currently under) cultivation have been significant constraints in the past; the cash and labor costs of clearing and preparing new land are likely to be an increasingly important factor."⁴ That is it should not be expected that event at the national level further land availability will be very large.

¹ For example World Bank, *Thailand: Selected Issues in Rural Development, Background Paper No. 4, November 1978*, p. 7.

² TURA Institute, *Land Policy and Land Use Planning, Bangkok, 1981*.

³ World Bank, *Thailand: Managing Public Resources for Structural Adjustment, March 1983*, pp. 77-78.

⁴ World Bank, *Thailand: Managing Public Resources for Structural Adjustment, Ibid.*

Table 6.11: FARM HOUSEHOLDS DISTRIBUTION AND AVERAGE LAND SIZE BY FARM SIZE, WET SEASON, 1980

Farm Size	Khon Kaen			Roi Et			Chiang Mai			Suphan Buri		
	No. of households	Average (rai)	Percent No. of HH.	No. of households	Average (rai)	Percent No. of HH.	No. of households	Average (rai)	Percent No. of HH.	No. of households	Average (rai)	Percent No. of HH.
No land under cultivation	8	—	5.67	8	—	10.67	47	—	28.66	—	—	—
0.1 – 4.99	11	2.44	7.80	12	2.01	16.00	47	2.74	28.66	1	1.00	2.38
5.0 – 9.99	25	7.06	17.73	11	7.54	14.67	34	6.97	20.73	3	8.30	7.14
10.0 – 14.99	13	11.71	9.22	12	12.09	16.00	22	11.36	13.41	4	10.75	9.52
15.0 – 19.99	29	17.46	20.57	9	17.38	12.00	7	17.33	4.27	5	17.12	11.91
20.0 – 29.99	27	23.57	19.15	9	24.02	12.00	4	22.35	2.44	9	24.84	21.43
30.0 – 49.99	22	38.36	15.60	10	40.62	13.33	3	36.90	1.83	7	39.17	16.67
more than 50	6	79.55	4.26	4	87.75	5.33	—	—	—	13	76.11	30.95
TOTAL	141		100.00	75		100.00	164		100.00	42		100.00
Average		25.74			27.34			16.28			25.33	

Source: Yongyuth Chalamwong and Tongroj Onchan, *Land Characteristics and Tenure Arrangement in Selected Rural Areas in Thailand*, Conference Paper No. 1 of ROFEAP, Kasetsart University, 1981.

Table 6.12: DISTRIBUTION OF FARM HOUSEHOLDS BY TYPE OF LAND OWNERSHIP

Type of Land Ownership	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri		Total	
	No. of HH.	Percent No. of HH.	No. of HH.	Percent No. of HH.	No. of HH.	Percent No. of HH.	No. of HH.	Percent No. of HH.	No. of HH.	Percent No. of HH.
Owned all (owned 100 percent)	93	65.96	45	60.00	22	13.42	13	30.95	173	41.00
Part-owned (owned 50 percent or more plus rented)	18	12.76	2	2.67	11	6.71	11	26.19	42	9.95
Part-rented (owned plus rented)	4	2.84	—	—	2	1.22	7	16.67	13	3.08
Rented all (owned 0 percent)	18	12.77	20	26.67	82	50.00	11	26.19	131	31.04
Owned no land (and not cultivated)	8	5.67	8	10.66	47	28.65	—	—	63	14.90
TOTAL	141	100.00	75	100.00	164	100.00	42	100.00	422	100.00

Source: Yongyuth Chalamwong and Tongroj Onchan, *Land Characteristics and Tenure Arrangement in Selected Rural Areas in Thailand*, op.cit.

Table 6.13 : LAND UTILIZATION BY PROVINCE, DRY SEASON 1979 AND WET SEASON, 1980

	Khon Kaen		Roi Et		Chiang Mai		Suphan Buri		Total	
	Total area	Percent of total	Total area	Percent of total	Total area	Percent of total	Total area	Percent of total	Total area	Percent of total
	(rai)	Percent	(rai)	Percent	(rai)	Percent	(rai)	Percent	(rai)	Percent
Dry Season:										
Land under cultivation	506.4	19.25	79.2	5.61	492.5	67.46	79.5	4.58	1157.6	17.78
(Idle) Land	2074.5	78.85	1321.9	93.64	148.0	20.27	1607.6	92.54	5152.0	79.14
Total ¹	2630.9	100.00	1411.6	100.00	730.1*	100.00	1737.2	100.00	6509.8*	100.00
Wet Season:										
Land under cultivation	2715.5	93.39	1360.9	95.39	53.4	4.97	1597.4	89.72	5727.2	79.87
Unused (Idle) Land	54.9	1.90	65.2	4.57	6.1	0.01	83.0	4.66	203.2	2.83
Total ¹	2892.2	100.00	1426.6	100.00	1073.9	100.00	1780.4	100.00	7173.1	100.00

¹ Included land rented out

Source: Yongyuth Chalamwong and Tongroj Onchan, Land Characteristics and Tenure Arrangement in Selected Rural Areas in Thailand, op.cit.

Table 6.14: DISTRIBUTION OF FARM HOUSEHOLDS BY WATER AVAILABILITY, WET SEASON, 1980

Water Availability	Khon Kaen			Roi Et			Chiang Mai			Suphan Buri		
	No. of H. H.	Total area (rai)	Average area (rai)	No. of H. H.	Total area (rai)	Average area (rai)	No. of H. H.	Total area (rai)	Average area (rai)	No. of H. H.	Total area (rai)	Average area (rai)
Irrigated year round	39 (10.80)	536.00	13.74	3 (2.03)	26.20	8.73	59 (22.87)	371.20	6.29	32 (23.19)	835.90	26.12
Irrigated in wet season	40 (11.08)	544.00	13.60	4 (2.70)	66.40	16.60	64 (25.97)	447.40	6.68	32 (23.19)	837.90	26.18
Irrigated in dry season	47 (13.02)	594.30	12.64	17 (11.49)	134.20	7.89	62 (24.03)	429.30	6.92	32 (23.19)	835.90	25.12
Natural flooding in wet season	2 (0.55)	3.50	1.75	1 (0.68)	1.00	1.00	11 (4.26)	102.70	9.34	—	—	—
Natural flooding in dry season	1 (0.28)	1.50	1.50	1 (0.68)	1.00	1.00	6 (2.32)	73.70	12.28	—	—	—
Rainfed in wet season	119 (32.96)	2243.00	18.85	64 (43.24)	1314.70	20.54	46 (17.83)	372.00	8.09	21 (15.22)	833.70	38.27
Rainfed in dry season	113 (31.30)	2111.20	18.68	53 (39.19)	1181.70	20.37	7 (2.71)	39.10	4.30	21 (15.22)	783.70	37.32
TOTAL	361	6033.50	16.71	148	2725.20	18.41	258	1826.40	7.08	138	4097.10	29.69
AVERAGE			11.54			16.88			7.70			30.8

Source: Yongyuth Chalamwong and Tongroj Onchan, *Land Characteristics and Tenure Arrangement in Selected Rural Areas in Thailand, op.cit.*

Marketing and Credit¹

(a) Marketing

6.38 Marketing system is an important factor for expansion of income and employment in farm and non-farm activities. The ROFEAP has examined marketing systems in rural areas in three aspects: (a) marketing for village farm products, (b) marketing for rurally produced nonagricultural products, and (c) marketing for manufacturing firms in rural towns.

6.39 Farm products that are covered in the village marketing study² are numerous and vary from village to village. Major farm products such as rice, chicken, fish and eggs are mostly consumed within the village; only a small amount is left for sale. Larger proportions of minor farm products such as vegetables, fruits, upland crops, pigs, animal skin, etc. are produced for sale.

6.40 Most farm products are marketed locally—that is they are sold to village buyers and the transactions take place at farm. Some amounts are sold to buyers from local amphoe town who many come to buy the products at farm or farmers may take the products to the buyers. Sales to other amphoe towns are minimal due to longer distance that farmers have to travel.

6.41 The marketing system of nonagricultural commodities is examined by focusing on five products, namely agricultural hand tools, mats, bamboo and cane products, pottery and cotton cloth. Study is also made on subcontracting managements in production of ready-made garments, knitted products, fish nets and silk.

6.42 There is a wide variation among villages in the organization of marketing systems for the non-agricultural products. In some cases, town-based firms or agents supply training, materials and transport for the products they contract out to villages. In some other cases, villagers organize the marketing system themselves. Problems that occur in the marketing of these products usually result from the fact that village producers go into town independently to sell their products to the same buyers. This disorganization of the village producers has lowered their own returns as transport costs eat up their profit margins.

6.43 The town marketing study³ on the other hand covers a selected number of products, namely ready-mades, silk weaving, cements products, furniture, fruits and vegetables, bean curd, and noodles. The most common problem of these enterprises is the high costs of materials. The problems of quantity and timing are not so serious except in the case of wood for furniture.

6.44 For ready made garment industry, nearly all firms in the North and the Northeast rely on materials bought from Bangkok. Northeastern firms supply primarily local consumers while Northern firms have a broader range of markets including Bangkok and foreign countries. The cement products industry, on the other hand, depends on localized materials. Since the outputs are bulky and have high transportation cost, the industry depends on the size of local markets.

6.45 The furniture industry is dependent on plywood supplied from Bangkok and some locally available wood. This industry faces competition from Bangkok based products. The agriculturally based

¹ Supportive and financial institutions are in Chapter 5.

² Merle Menegay, *An Marketing Perspective For Village Farm Products a Basis for Discussion*, Conference Paper No. 15 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981.

³ Nongluck Suphanchaimat, *Rainfed Farm Household Modelling in Khon Kaen*, Conference Paper No. 25 of ROFEAP, Center for Applied Economics Research, Kasetsart University, 1981.

industries, where perishability of outputs or input is important are shown to depend on the strength of local demand and the development of transport sector.

(b) Credit

6.46 Credit is another important instrument in the development of the economy. Credits extended in the rural sector are likewise important in shaping the development of that sector. Traditionally, rural households relied on informal credit sources. Little information is known about informal credit arrangements.

6.47 A survey was made on ways of finance by farmers.¹ It shows that the majority of small farmers rely on credits from relations and neighbors and other informal sources. Specifically more than half of farmers with less than 11 rais of land borrow from relations and neighbor. The average rate of interest of these informal sources were between 25–35 percent.²

6.48 Since 1967, the Bank of Agriculture and Agricultural Cooperatives (BAAC) has however, become a key lending agency for the rural sector. The BAAC has extended agricultural credits directly to farmers or to farmers associations and to agricultural cooperatives. In 1979 the total BAAC's loans outstanding was B 9.2 billion, and the bank had 58 provincial branch offices, 409 field offices and over 780,000 farmers registered as direct clients.

6.49 The commercial banks are other important institutional credit sources for agriculture. Their roles in rural financial sector has increased since the intervention of the Bank of Thailand (BOT) in 1967. In that year BOT was first authorized to rediscount promissory notes of the commercial banks arising from agricultural transactions. The use of rediscounting facilities was moderate. By the end of 1975 the BOT has required the commercial banks to lend to agriculture a certain quota of their total lending. The quota was set at 5 percent in 1975 and raised to 13 percent by 1980. Another measure taken by the BOT to increase the agricultural credits was to replace the previous control over the opening of new branches with the requirement that at least 60 percent of new bank branches' deposits be lent in the local area and at least one-third must go to farmers.

6.50 Credits are also important for non-farm enterprises. Two types of non-farm enterprises have been discussed above. One type of them is those enterprises found in non-farm firms in rural towns and villages. Examples are processing enterprises for sugarcane, cassava, kenaf, fruits and vegetables; silk and cotton weaving; wood carving; ready made garments; pottery; ceramic, etc. The other type includes non-farm enterprises of farm households, such as silk weaving, pottery making, mat making, baskets and bamboo products.

6.51 Sources of lending for this purpose have been commercial banks, BAAC, the Industrial Finance Corporation of Thailand (IFCT) and the Small Industries Finance Office (SIFO). However, the BAAC has lent mainly to finance agricultural activities, while the lending to non-farm sector by commercial banks is not possible to analyze since it occurs in the form of overdrafts. Therefore only IFCT and SIFO roles will be discussed.

6.52 The IFCT is a development bank assisted by government with low interest loans, guaranteed loans and exemptions for taxes on income and profits. From 1960–1980, 541 loans were approved by the IFCT for B 6.6 billion and B 3.1 billion were outstanding in the middle of 1980. Manufac-

¹ Prajerd Sinsarp and Sri-on Somboonsarp, "Capital Accumulation of Farmers in Thailand, 1974/75" *Journal of Economics and Business Administration*, Center for Applied Economics Research, Kasetsart University, November 1976.

² See Direk Patmasiriwat, *Credit Expansion for Rural Poor Areas*, TURA, 1981.

turing represented two-thirds of the loans outstanding with cement the single largest industry. The agri-business and food processing was the second major clients with 17 percent loans outstanding. However 35 to 40 percent of these loans were made in the central region and 50 percent in Bangkok alone.

6.53 SIFO, on the other hand, is the only government agency that specifically provides finance to small industries. From 1964–1975, SIFO has made B 236 million loans to small industries. Most of the loan were made to urban areas. From 1964 to 1977, 32 percent of the loans went to Bangkok, another 20 percent to provinces in the Central region and only 15 percent went to the Northeast. In 1978, the Central region obtained almost 70 percent loan and the Northeast only 3 percent.

6.54 Results from the ROFEAP indicate that rural households have come to rely more on institutional credit sources. Except in Khon Kaen, rural households in other provinces had loans outstanding in February 1981 more than half (61–85 percent) of total loans from formal lending sources. Table 6.15 reports these ROFEAP survey results.

Table 6.15: NUMBER AND AMOUNT OF LOANS OUTSTANDING BY SOURCE AND PROVINCE, FEBRUARY 1981.

Province	Source of Loan								
	Institutional			Non-Institutional			Total		
	No.	Percent	Amount per Loan	No.	Percent	Amount per Loan	No.	Percent	Amount per Loan
Khon Kaen	24	40.0	8,409	46	60.0	6,657	70	100	7,258
Roi Et	15	85.5	4,100	3	14.5	3,532	18	100	4,005
Chiang Mai	11	78.5	8,147	5	21.5	4,920	16	100	7,139
Suphan Buri	16	61.3	9,625	24	38.7	4,051	40	100	6,281
Total	66	53.8	7,726	78	46.2	5,624	144	100	6,587

Source: Yongyuth Chalamwong, *A Descriptive Analysis of Wealth Income and Credit in Rural Thailand*, op.cit.

B. RURAL ECONOMY AS PART OF A NATIONAL AND WORLD ECONOMIC SYSTEM

6.55 The importance of the rural economy lies in its agricultural contribution to the national development. Its contributions will be discussed in terms of production, employment, and foreign trade.

Production and Growth

6.56 The contribution of agriculture to national output as measured by GDP has relatively declined. Within two decades the proportion of agriculture to GDP decreased from 40 percent (in 1960) to 26 percent (in 1980). Its absolute production level has steadily increased however. The value of agricul-

tural production was ฿ 21.5 billion in 1960, ฿ 38.5 billion in 1970 and ฿ 176.3 billion in 1980, respectively. (See Table 6.16)

Table 6.16: CONTRIBUTION OF AGRICULTURE TO GDP, 1960-80.

Year	GDP (current price)		
	Agriculture	Total	Share Percent
1960	21.5	54.0	40
1970	38.5	136.1	28
1975	94.1	298.8	31
1980	176.3	673.7	26

Source: World Bank, *Thailand: Program and Policy Priorities for an Agricultural Economy in Transition*, Vol. II, Table 2.

6.57 The overall agricultural sector has grown during the last two decades at a rate of about 5 percent per annum. Crops, which account for over 70 percent of GDP, have increased about 4.5 percent annually. More recently, the agricultural output grew at a lower rate (3.5 percent) due to the marked slowdown of fisheries and forestry. The livestock sector seems to be on a continuing growth path. (See Table 6.17)

Table 6.17: AGRICULTURAL GROWTH BY SECTOR (IN CONSTANT PRICES)

	Subsector share in agricultural GDP (percent)				Annual growth (percent) a		
	1960	1970	1975	1980	1960-70	1970-75	1975-80
Crops	74	70	70	73	4.7	5.2	3.3
Livestock	14	11	14	13	3.5	7.6	5.5
Fisheries	3	12	10	9	20.7	4.7 ^b	-3.1 ^c
Forestry	9	7	6	5	4.1	2.9	0.3
Total	100	100	100	100	5.5	5.1	3.5

a Semi-long time trend regression; 1960-70 is at 1960 constant prices and 1970-80 is at 1972 constant prices

b 1970-77

c 1977-80

Source: NESDB and Bank of Thailand, quoted in World Bank (1982).

Employment

6.58 The Thai rural sector is most important to the national economy in terms of employment that it can accommodate, though the limit of this capacity is being reached. Table 6.18 shows that the agricultural employment increased from 11.3 million persons in 1960 to 15.4 million persons in 1977/78. The average rate of growth was 1.7 percent between 1960-1970 and 1.9 percent between 1970-1977/78. As the nonagricultural employment has increased during the corresponding periods at higher rates by 3.9 percent and 6.5 percent respectively, the share of agriculture to total employment declined from 82 percent in 1960 to 73 percent in 1977/78.

Table 6.18 : EMPLOYMENT 1960-77/78

	Employment			Average annual increment			
	1960	Average		1960-70		1970-78	
		1970	1977/78		Million	Percent	Million
	Million						
Agriculture	11.3	13.4	15.4	0.21	1.7	0.27	1.9
Nonagriculture	2.4	3.5	5.6	0.11	3.9	0.28	6.5
Total	<u>13.7</u>	<u>16.9</u>	<u>21.0</u>	<u>0.32</u>	<u>2.1</u>	<u>0.55</u>	<u>2.9</u>
Share of agriculture to total (percent)	82	79	73	66		49	

Source: NESDB and Bank of Thailand.

6.59 Growth in agricultural employment has been partly possible because of the expansion of farm holding area. According to the Office of Agricultural Economics Statistics the farmholding area increased from 61.9 million rai in 1959/60 to 92.5 million rai in 1969/70 and to 115.0 million rai in 1977/78 with respective increments of 30.6 and 22.5 million rai. The above Table has shown that agriculture has been able to absorb 210,000 persons annually during 1960-70 and 270,000 persons annually during 1970-77/78. This implies that agriculture is able to sustain this level of new labor force it must have experienced real increased in income. The analysis in Section A shows that this is possible because farmers tend to have other incomes especially non-farm and off-farm income in addition to their normal farm income.

Migration

6.60 Migration is an important phenomenon that links the rural sector with the national economy. The migration flow is caused partly by shifts in economic activities of agricultural or nonagricultural sectors. This will be briefly reviewed here.¹

¹ This section draws on Jamlong Atikul, Wuttidhep Indhapanya, et al. *Spatial Planning, Migration and Human Resource Mobilization*, APDC, 1983.

6.61 The major migration flows in Thailand are rural to rural and rural to urban whereas the urban to rural and urban to urban flows are a small part; only 35 percent of total migrants have their origins in urban areas. Reasons for migration are largely economic. Landlessness, poor quality of land and lack of job opportunities have been the major cause of migration. Improvement of transport and communication further facilitate migration flows.

6.62 Most migration takes place within the region, i.e. migrants move short distance within and across provinces rather than across regions. During 1955–1960, 74 percent of in-migrants were shown to move within their geographic regions. The intra-regional migration was highest in the Northeast and lowest in the North. The volume of interregional flows, on the other hand, shows that flows from the North, Northeast, and South into the Central are the strongest among all inter-regional flows. The migration flow into the Central came mostly from nearby provinces in the Central region into Bangkok Metropolis and the inflow from the Northeastern region. During 1965–1970, the in-migration from the Northeast into Bangkok was 22.4 percent of total inflow.

6.63 Most of the migration described above was permanent. In 1977, 67.6 percent of those who migrated to the Central region was permanent migrants. The Northeast was the only region that had more temporary migrants than the permanent ones. And most of these temporary migrants were reported to look for off-farm work during the dry season.

Foreign Trade

6.64 Thailand is a relatively open country. Agriculture contributed most to the total exports. The value of agricultural exports rose from a mere ฿ 7.6 billion to ฿ 77.6 billion from 1960 to 1980, an eleven-fold increase. In absolute terms, it is expected to further make a significant contribution to overall exports and hence foreign exchange. (See Table 6.19)

Table 6.19 : CONTRIBUTION OF AGRICULTURAL EXPORTS

Year	Exports (current value)		
	Agriculture	Total	Share (percent)
1960	7.6	8.4	91
1970	10.4	14.8	70
1975	29.5	45.0	66
1980	77.6	133.0	58

Source: NESDB and Bank of Thailand.

6.65 In relative terms the share of agricultural exports has decreased from 91 percent in 1960 to 58 percent in 1980. However, these figures understate the importance of agricultural exports as a significant proportion of manufactured good exports are in the form of processed agricultural products.

6.66 As in production agricultural exports have now been diversified. Rice used to account for more than half of total agricultural exports before 1960s and in 1980 it was 39 percent-still the most

important export crops. Maize, sugarcane, and cassava have become important as additional sources of foreign exchange. The Thai agriculture has been able to produce food crops, livestock products, and fisheries in quantity sufficient for domestic production and also for exports. From this foreign exchange earning it has made possible for Thailand to import other capital goods and raw materials.

C. ADVANTAGES OF DISTRIBUTING BENEFITS OF GROWTH

6.67 It is clear from the above analyses that non-farm activities form an important integral part of the rural economy. The growth of the rural economy of Thailand has been based upon the agricultural expansion until recently. Non-farm activities have now become a significant source of rural incomes. Future growth of the rural economy therefore will depend on both agricultural and non-agricultural growth. That is future rural development will be attributed to wider factors. There are certain advantages associated with the distribution of benefits of growth to a wider range of economic activities, wider scales of activities, wider space of the country and a wider population. These will be discussed in this section.

Wider Economic Activities

6.68 Non-farm activities, that have been reviewed in this report, are relatively small in number. The limited number of these activities are to a large extent explained by the limit of marketing facilities and the high transportation cost. Overcoming these two problems, the expansion of the non-farm and off-farm activities would benefit the rural sector as a whole.

6.69 The ROFEAP has shown that rural off-farm income has helped stabilize farmers' incomes over the year round.¹ In certain months of the year, farm cash incomes could become negative. It is the off-farm income and non-farm incomes that help off-set the deficits and this providing farmers with cash throughout the year. The consumption expenditure patterns of farmers, which have been fairly steady throughout the year, confirm this advantage.²

6.70 The results from a study³ of the ROFEAP on the effect of off-farm employment on the structure and the distribution of income give additional support for promotion of off-farm and non-farm activities. The study has shown that the main sources of agricultural households incomes are not only farm production but also off-farm and non-farm activities. Poorer rural households have been shown to be more dependent on off-farm income than richer households while the latter earn more from farm production. Incomes from off-farm employment and household industrial products that used to be negligible have become the major sources of income for rural households.

6.71 It is the total off-farm incomes that help reduce the problem of income inequality among the farmers in addition to its roles in supplementing and stabilizing the income of farm households. Specifically, the study shows that the pattern of income distribution among various farmer groups become more equal when the total off-farm incomes are taken into consideration.

¹ Tongroj Onchan and Yongyuth Chalamwong, *Rural Off-Farm Employment and Income of Rural Households in Thailand: Some Research Findings*, Research Paper No. 4 of ROFEAP, Center for Applied Economics Research, Kasetsart University, October, 1981.

² Somsak Priebprom, *The Role of Farm, Non-farm Enterprises and Off-farm Work in Household Employment and Income Generation on Irrigated and Rainfed Farms, Khon Kaen, Thailand*, op.cit., Table 19.

³ Thanwa Jitsanguan, *Effect Off-Farm Employment on the Structure and The Distribution of Income*, Research Paper No. 15 of ROFEAP, Center for Applied Economics Research, Kasetsart University, August, 1982

Wider Scales of Activity

6.72 One of the most interesting results of the ROFEAP is that generally the return per unit of non-farm activities is very low. However, farm households are still undertaking these activities for the sake of additional employment. Most of farm households engage in non-farm enterprises in a rather limited scale, producing just enough to feed local markets. The cost of production is consequently high. Coupled with limited markets and low prices for their products, incomes received by the farmers tend to be low.

6.73 Expanding non-farm activities to a wider scale would benefit the farmers in various ways. First, producing a larger amount of output would reduce the production cost as most farmers are now producing at low scale. Second, by having more outputs, rural households would be able to reduce the unit cost of transportation. Most farm households market their products by bringing them from the village to town. Larger outputs would be able to reduce the unit cost of transport for most non-farm products now marketed by farmers. It is expected therefore that expansion of non-farm production to a wider scale would bring higher returns to farmers. However, this will be successful only if farmers are assured of markets for their products. Marketing information will have to be channeled to these rural households. Furthermore, in certain cases changes in government regulations may have to be considered. For example, in the case of silk industry if more than 5 persons are employed the owner of the enterprise will have to pay taxes¹ thus discouraging them from further expanding their scale of activities. Implied in the above argument is that there would be advantages in expanding the scales of non-farm activities provided that there is market for the products. That is it will have to be selective as to which product should be expanded.

6.74 Assuming that the marketing problem of the non-farm products can be taken care of, another important advantage is the increased employment that would accompany the expansion of non-farm activities. The benefits of the increase in employment will be of two categories. First, additional labor force would be employed. That is new jobs would be created for unemployed rural workers. Second, for those who are only partially employed would be more fully utilized.

6.75 The potential of labor supply for this expansion readily exists as the ROFEAP reports: For those who are economically active (i.e. belonging to 15–60 year age group), 92.15 percent are reported as family labor; 74.92 percent of which are full time labor and 17.23 percent are part-time labor. During the summer months additional labor force from school children would also be available.

Wider Space of the Country

6.76 Growth in the agricultural output during the last two decades has been largely attributed to the Central region. According to a World Bank report.² “During the 1960s, part of the 4.7 percent annual increase in crop production had been due to a 1 percent increase in yields, but area expansion in the 1970s (4.9 percent per year) outstripped crop production, and hence average yield decreased by 0.6 percent per year”. Only in the Central region has there been a substantial increase in yields, as a result of improved water control on 20 percent of the area and intensified production. Fertilizer application varies from an average of 60 kg. of fertilizer per ha in 1975 in the Center, compared to only 24 kg/ha in the Northeast and only 18 kg/ha in the North. Hence, although modernization of agriculture is proceeding quite rapidly, large parts of the North, Northeast and South still rely mostly on subsistence agriculture.

¹ Pradit Charombut, *The Silk Weaving Industry in Northeastern Thailand*, Working Paper No. 3 of ROFEAP, Center for Applied Economics Research, Kasetsart University, August, 1980, page 10.

² World Bank, *Thailand: Program and Policy Priorities for an Agricultural Economy in Transition*, op.cit.

6.77 Coupled with industrial concentration in Bangkok and Central region, the distribution of income tends to be unequal among the regions. Table 6.20 shows both the shares of regional GDP and per capita incomes of these regions to be fairly uneven. The analysis above has shown that rural non-farm and off-farm activities have helped equalized incomes among farmers of different farm sizes. Independent promotion of non-farm and off-farm activities in each region may not be able to reduce this interregional disparities. Therefore, distributing benefits of growth to wider space would be able to serve interregional income disparity reduction purpose.

Table 6.20 : INCOME DISTRIBUTION AMONG REGION, 1960–1979

	North	Northeast	South	Center	Bangkok	Whole Kingdom
1. Share of Regional GDP at Constant Prices (percent)						
1960	15.8	17.0	14.1	29.3	23.8	100.0
1970	15.2	16.0	12.8	27.5	28.5	100.0
1979	14.9	14.7	11.8	31.2	27.4	100.0
2. Regional Per Capita Income at Constant Prices (baht)						
1960	1,496	1,082	2,700	2,564	5,630	2,106
1970	2,699	1,822	3,858	4,662	4,234	3,849
1979	8,781	4,991	12,683	17,655	30,161	12,067

Source: NESDB, *Rural Poverty Eradication Plan, 1982 - 1986*, op. cit., p. 3.

Wider Population

6.78 It was reported in Section B that agriculture had been growing at an annual rate of slightly higher than 5 percent and it was only recently that the rate came down to about 3.5 percent per annum. Despite this substantial growth the World Bank¹ reports that “in 1975/76 an estimated 31 percent of population had incomes below the absolute poverty line. With 90 percent of the poor residing in the rural areas, the poverty problem in Thailand is first of all a rural problem, and almost 80 percent of all the rural poor can be found in villages of the Northeast and North (54 percent and 24 percent, respectively). The overwhelming majority of poor households, over 85 percent are farmers.” However, the World Bank also notes that the incidence of poverty in rural areas has declined substantially since the early 1960s from 61 percent in 1962/63 to 35 percent in 1975/76. Furthermore, the NESDB² has estimated that there were 11.5 million rural poor in 1979. The World Bank and NESDB estimates are given in Table 6.21 and 6.22.

¹ World Bank, *Thailand: Selected Issues in Rural Development*, op.cit., pp. 4 - 5.

² World Bank, *Thailand: Program and Policy Priorities for an Agricultural Economy in Transition*, op. cit., page 12.

³ NESDB, *Rural Poverty Eradication Plan, 1982-1986*, p. 4.

Table 6.21 : INCIDENCE OF ABSOLUTE POVERTY^a BY REGION AND LOCATION, 1968-76.

	Poverty as percent of population			Percent of poverty group
	1962/63	1968/69	1975/76	1975/76
Kingdom	57	39	31	100
Urban	38	16	14	10
Rural	61	43	35	90
Northeast	74	65	44	50
Urban	44	24	20	1
Rural	77	67	45	49
North	65	36	36	23
Urban	56	19	18	1
Rural	66	37	34	22
Center	40	16	14	9
Urban	40	14	12	1
Rural	40	16	15	8
South	44	38	31	12
Urban	35	24	22	1
Rural	46	40	33	11
Bangkok	28	11	12	6

^a The absolute poverty line is defined as \$ 100/year/person in rural areas and \$ 150/year/person in urban areas (1975/76 prices).

Source: "Income, Consumption and Poverty in Thailand," World Bank Staff Working Paper No. 364, November 1979 (Table 3.1).

Table 6.22 : RURAL POVERTY BY REGION

Region	Percentage of rural poverty 1975/76	No. of rural population 1979	No. of rural poor 1979	Percent
Northeast	45	13,372,877	6,017,795	52.3
North	34	7,911,038	2,689,753	23.3
South	33	4,719,564	1,557,465	13.5
Central	15	8,339,136	1,250,870	10.9
Whole Kingdom	33.5	34,342,615	11,515,874	100.0

Source: NESDB, *Rural Poverty Eradication Plan, 1982 - 1986*, op. cit., p. 4.

6.79 It is interesting to note the reasons given by the World Bank on the decline of the incidence of rural poverty. They are expressed as follows:¹ (a) the increase in total cultivated area, (b) the increases in agricultural prices accompanied by the ability of some of the previously poor groups to switch into more profitable crops, and (c) increasing reliance on off-farm income opportunities. It also notes that the importance of off-farm income is the least known, but the analysis indicates that in 1975/76 it comprised 26 percent of the total rural household income in both the North and Northeast and represented 59 percent and 47 percent of total cash income in the North and the Northeast, respectively.

D. IMPLICATIONS

6.80 In this chapter, the macro economic aspect of the rural economy has been examined using the data and information generated under the ROFEAP and other secondary data. The review provides salient features of the rural Thai economy. In this concluding section implications of the above described conditions will be drawn with particular reference to the policy recommendations and program and project issues.

Selected Policies

6.81 Before outlining the policy recommendations it is necessary to summarize what the above discussion has implied. Two sets of implications are clear; one concerning the agricultural enterprises and the other nonfarm and off-farm activities.

6.82 The agricultural sector has been shown to have low productivity. Yields have in fact decreased in recent years. Despite this productivity trend the agricultural output has increased at a moderate rate which has been possible by the expansion of holding areas. The frontier of available land is approaching its limit. Yet the intensity of land use is still low. In addition to this, there is another problem of landless farmers who have to rely on non-farm and off-farm employment. All of this has resulted in low income of farmers, generally and especially those landless and small farmers.

6.83 There are several reasons explaining the low level of productivity in agriculture. The Thai agriculture is mainly of subsistent nature. Production is kept expanding on marginal land whose suitability for agriculture is low. Being subsistent agriculture, the utilization of modern inputs such as fertilizers, insecticides etc, is low. One of the most important factor discouraging the increase in agricultural productivity is the pricing policy of the government which has kept the prices of agricultural goods especially rice low. The farmers have increasingly sought additional income from nonagricultural sources and off-farm employment.

6.84 Non-farm activities in the areas covered by the ROFEAP consist of a limited number of enterprises. At the village level non-farm enterprises, which are generally of small scale, yield low returns. Rural households usually deliver non-farm products to town independently thus causing high transport cost. The ROFEAP also shows that the production cost of non-farm products tends to be high due to their small scale. The latter is to some extent limited by the credit available to rural households for expansion of these activities. Institutions which provide support for development of non-farm activities are few and largely ineffective.

¹ World Bank, *Thailand: Program and Policy Priorities for an Agricultural Economy in Transition*, *op. cit.*

6.85 Rural off-farm employment consists of nonagricultural off-farm and agricultural off-farm activities. Nonagricultural off-farm employment is the larger portion of rural off-farm work and incomes generated are mainly in the form of hired nonfarm labor wage and salaries. Agricultural off-farm on the other hand is mainly in the form of hired agricultural labor. The agricultural off-farm employment suffers from the seasonality of demand and low wages whereas the nonagricultural off-farm employment faces high transport cost of travel from their village to town thus reducing their income.

6.86 Two set of policies can be drawn from the above analysis of problems; one concerning agricultural policy and the other non-farm/off-farm employment policy.

6.87 It is clear that if agriculture is to continue contributing to the growth of GDP the government must have a policy to increase the sector's productivity. It has been analyzed¹ that there is potential for productivity improvement through improving institutional performance (particularly in research and extension). Credits must be made available to the agricultural sector for adoption of new techniques and intensification of input use. Agricultural pricing policy is another policy concern. The government is advised to minimize its market intervention and to reduce market distortion. Policy measures such as agricultural export taxes, regulations concerning the production of certain crops, etc. should be reexamined.

6.88 The overwhelming importance of rural non-farm activities is very well illustrated by the ROFEAP. Promotion of rural non-farm industry is clearly inevitable regarding the income and employment that it has generated for the rural sector. Distinction must be made, however, among household industries, village industries and town industries. Data and information currently available is not sufficient to specify which type of rural non-farm industries should be promoted and how. And these industries many vary from region to region according to location, raw materials and other factors.

Program and Project Issues²

6.89 From the discussion in the chapter it seems that a few issues must be addressed in the programs or projects that will be developed to implement the policy of rural industry promotion. Some of these issues will have to be studied first before the actual implementation of the policy.

6.90 The first question that needs a fairly definite answer is what types of rural industries should be promoted. A general promotion of all rural industries will not be feasible nor effective. Each type of industries will have differing employment and income generation effects. Studies must be made as to what type of industries have high potential for employment generation and would be viable once promoted. Factors such as locations, raw materials available in localities, and potential markets will have to be considered. In this regard, the type of industries that should be located at each level of hierarchy of settlements (village, tambon, amphoe or town and changwat or city) will also have to be determined.

¹ It is beyond the scope of this paper to discuss the agricultural policy in detail. It has been more fully discussed elsewhere. See, for example, World Bank, *Thailand: Selected Issues in Rural Development, Background Working Paper No. 4, November 1978* and World Bank, *Thailand: Program and Policy Priorities for an Agricultural Economy in Transition, Report No. 370 Ja-TH, June, 1982.*

² Discussion in this part will be restricted to rural non-farm industries, for a discussion of agricultural programs or projects see references above.

6.91 Marketing prospect is another major concern. Domestic (local and other) and international markets potentials for prospective products should be studied. Development of marketing system for these rural small-scale industry products is important. That is prospect for the products must be established and network for distribution created and planned.

6.92 The above are two important issues that must be resolved first. Having decided what type of rural industries to be promoted, the government then will have to promote their production and distribution. On the input side, the government will have to provide credit for establishment and/or expansion of rural small-scale industries, and extension services. The government will have to improve existing institutions to serve them properly. Therefore, financial and technical service institutions should also be considered.

Chapter 7

**Conclusions, Policy Recommendations and Suggested Programs of
Action**

**by
Narongchai Akrasanee**

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**CONCLUSIONS, POLICY RECOMMENDATIONS
AND
SUGGESTED PROGRAMS OF ACTION**

7.01 This last chapter brings together the main conclusions of ROFEAP, supplemented by the views of the authors in this volume. The intention is to use these results for the formulation of policy recommendations which, in turn form the basis for programs of action to be suggested. The point that a monumental amount of research effort has been spent under ROFEAP. Therefore the results should be used to serve the ultimate objective of the project, i.e. to initiate a program that would increase the opportunities for rural off-farm income and employment. It is our view that there is a real need for such a program, and ROFEAP allows us to initiate to start in an effective manner.

A. CONCLUSIONS OF THE REPORT

Significance of Off-farm Income to the Rural Households

7.02 ROFEAP results show clearly that non and off-farm employment is a major activity and a major source of income of the rural household in the project areas, especially in the poor farming regions. Apart from being a major source of income the employment also serves as an effective income stabilizer during the seasonal fluctuations.

7.03 Farmer's income consists of three components: farm, non-farm and off-farm. The income level and stability are the result of the interplay of the three sets of activities and how the farmers can maximize the returns to their labor by allocating their time among these activities.

7.04 ROFEAP has emphasized employment in village industry and in town industry. ROFEAP's results show that the two types of industries possess enough distinctive features such that they should not be treated in the same way.

7.05 Studies other than ROFEAP have also confirmed ROFEAP's results, and suggest that ROFEAP's conclusions can be generalized to the national level. And since farm income opportunity is becoming more limited, it is likely that the rural households will have to rely more on non and off-farm employment.

Village Industry

7.06 Non-farm activities are usually the manufacturing of craft products, referred to as village industry. While the rural households rely on village industry as a major source of income, the industry has been little developed over the years. The state of village industry varies from product to product, depending upon factors affecting the products, which are different among different products. The factors identified range from marketing to the availability of raw materials, and to production capability of the farmers. The main conclusion is therefore that problems of the village industry can not be generalized. Rather, the problems are specific to specific products.

Town Industry

7.07 Town industry plays a major role in generating income and employment for the rural households, because of its very close link to the rural economy. Most town industries are faced with several problems as discussed in detail in the report, and are likely to grow only slowly unless an effective scheme of assistance is organized. The problems identified include market limitation, finance, production cost, raw materials, taxation, and general management.

7.08 Industrial policy of the government so far has not had favorable impact on the development of either village or town industries. For industry in general the industrial incentive system and the availability of basic infrastructure in fact have the effect of being biased in favor of Bangkok (and nearby provinces) location and thus against location in provincial towns. The government so far has few activities which are of a real help to town industry. And the various activities designed to assist village industry have not been effective, because they usually do not have a combination of marketing and skill training components. The private sector and the donor countries and agencies have played a very small role in the promotion of village and town industries.

7.09 Finally rural economy has been shown to be very much an integral part of the national economy. The promotion of rural income and employment, through both farm and non/off farm activities will contribute towards the overall national development.

B. POLICY RECOMMENDATIONS

7.10 The RTG should adopt as its major policy to promote rural non-farm and off-farm employment, for this would contribute to the increase in income level of the rural households. Such a policy should be combined with the policy to increase farm income, for they have been shown to be interrelated. The non-farm and off-farm employment policy should have a component designed to assist the rural households to maximize their income, and another component designed to increase employment opportunities by creating demand for such employment.

7.11 The policy to promote village industry should be product specific, and should concentrate more on marketing and skill (training) components. Several arrangements can be made. Products (with all the necessary design and specification) which can be sold should be identified and an arrangement can be made to assist the farmers to produce them. Or a subcontracting arrangement may be made, with all materials and knowhow provided to the farmers. The arrangement which combines marketing and skill component mentioned above is strongly recommended.

7.12 Because of its strong link to the rural economy, the government should take an active role in the promotion of town industry, with participation from the private sector. These should be a program to help lessen problems of the town industry as identified in this report.

7.13 ROFEAP's results have suggested that policy for village industry and for town industry should have a different emphasis. For town industry the policy should be to create investment opportunities which, in turn would create rural employment. Under the existing trade and investment regime and the diversity in regional development it is not easy to promote town industry. First the correction in the policy bias is needed. Assuming that incentives and advantages for urban industry are difficult to reduce, the correction in the bias means the increase in incentives for town industry. This may be accomplished by giving town industry higher priority in the investment promotion scheme, by setting up a mechanism to allow town industry an easier access to credit of the formal financial sector, by providing industrial facilities, and by giving technical assistance for production and management, in that order. At present the only support is in the area of technical assistance provided by the ISI, and is available only in the Northern Region.

7.14 Having created investment opportunity and investment is realized, then the government should improve and add an other assistance programs. The training of workers, promotion of the production of raw materials, etc., will be useful to town industry when there is enough incentive for investment. It should be noted that entrepreneurs usually know more about marketing and general management than government officials, and thus for town industry these activities should have a low priority.

7.15 For village or cottage industry what is needed is sales opportunity, more so than investment opportunity. In this case the activity does not require much investment, and the activity owners are often the workers themselves. Thus government policy should concentrate on sales promotion or marketing. The assistance program should include the identification of the market, assistance for product design, training on production, plus perhaps credit assistance for raw materials.

7.16 It is noted here that the policy recommended for the promotion of village and town industries is not made at the expense of the promotion of farm activities. The significance of farm income and employment is fully realized. The promotion of farm activities is not discussed at length here only because a number of such activities have been on-going. ROFEAP has emphasized the promotion of non/off-farm activities because they have been few in number, especially the effective ones, relative to their contribution to employment and income of the rural households.

C. SUGGESTED PROGRAMS OF ACTION

7.17 Programs of action suggested may be organized into the formulation of rural industrialization strategy, improvement in the existing promotional activities and introduction of new activities, and assistance programs for donor countries and agencies. Only programs related to rural industrialization are considered.

Formulation of Rural Industrialization Strategy

7.18 In order for the rural industrialization program to be effective RTG must first have a blueprint for rural industrialization. Much of the necessary information for the formulation of rural industrialization strategy has already been made available by ROFEAP and the World Bank study referred to in Chapter 6. Studies sponsored by the NESDB on the economic potential of other regions, i.e. the West, the South and the Eastern Seaboard, could also be used for the purpose. Additional information required should be obtainable through a limited survey work.

7.19 The NESDB should be responsible for this project. It should work with the Ministry of Industry (DIP and the Industrial Economics Division) the Industrial Restructuring Committee should oversee the project during its formulation as well as implementation stages.

Promotional Activity Programs

(a) Enterprise development at the village level

7.20 ROFEAP has shown that there are actual and potential entrepreneurs of various types at the village level. If these entrepreneurs can be promoted, they should be able to develop village industry more effectively.

7.21 At present some of the more remunerative activities like silk weaving and garment making are tied into the larger private enterprises, through subcontracting or other arrangements. Most of the enterprises, however, suffer from raw material constraints, limited knowledge of markets and products,

poor technological processes, etc. all the basic obstacles to any enterprise. The only major institution which seems active in promoting this level of entrepreneurship is the Community Development Department.

7.22 At the local level CDD agents work in collaboration with DIP/ISI in providing training and introducing new product lines. Though there have been remarkable exceptions, the CDD has not been particularly effective in raising village incomes in this way.

7.23 Much of the problem is that most of the over 9000 agents have, according to a ROFEAP study, backgrounds in sociology, anthropology, social work, etc. They do not have backgrounds in economics, or business or finance or development in general. Thus, for example, they provide training for the production of crafts which not only have limited markets, but also provide lower returns than the old crafts.

7.24 There would seem here to be some potential for reaching village entrepreneurs in a more effective manner. Types of more effective assistance might include creation of intermediate financial institutions, linking enterprises to existing financial institutions and technical assistance units, arranging subcontracts and purchases by larger industrial and commercial firms, identifying markets and the assistance required to enter and expand in those markets (e.g. credit, training, technology, etc.), arranging for the assistance, appraising and screening individual or group projects on behalf of banks, IFCT or others, and so on.

7.25 For the CDD to become effective in this way, it needs support. As in other countries this kind of operation is not highly regarded in economic policy circles, and the worth of CDD activity is viewed as a social welfare operation. Assistance to the department should probably take the form of a combined formal and informal (i.e. on-site) training program for CDD and ISI staff at all levels; with the basic purpose of providing the staff with a more business-like orientation. At a later stage this could be followed by provision of key facilities and supplies for existing and new CDD and ISI Regional Centers.

7.26 The status of the CDD and ISI as public agencies will of course limit the effectiveness of what can actually be made to happen in the field. The issue here is really one of maximizing the effectiveness of an existing recurrent budgetary expenditure. Even if only 10 percent of the staff can be upgraded through a project, it nevertheless represents 900 people working better at the village level.

(b) Program to promote town industry

7.27 It is necessary that the program to promote town industry should have a number of components, discussed in turn below.

- (i) Investment promotion. The BOI should have a program to identify industries in provincial towns it would like to promote. Under the existing Investment Promotion Act of 1977 this process is required. The BOI should then announce the promotional list, including the maximum incentives offered. For this purpose restriction in terms of investment location should be made as flexible as possible.
- (ii) Industrial location. The IEAT should accelerate the construction of industrial estates in provincial towns. In addition it should seek to identify more areas to be designated industrial areas, so that basic infrastructure can be provided accordingly.
- (iii) Credit arrangement. RTG should request the Ministry of Finance and the Bank of Thailand to develop a mechanism that would make it easier for small scale rural enter-

prises to obtain credit from financial institutions. A mechanism such as a credit guarantee scheme has been proved viable in several countries¹. What is required is the setting up of an institution (or of a unit under the institution such as the Bank of Thailand or the IFCT) and for RTG to contribute fund to the scheme. In the study cited above the credit guarantee fund can generate credit for small scale industries 10 times its size, if suitable arrangements are made.

Apart from the credit guarantee fund, RTG should accelerate the process of changing SIFO to an effective and viable financial institution. All of the necessary studies for SIFO have been done. What is needed is a decision to improve the status of SIFO.

- (iv) Technical assistance and industrial facilitation program. DIP already has a number of activities designed to assist town (and village) industries. It is setting up another ISI in the Northeast. DIP should be supported to open ISI in other regions as well, including branches of ISI in larger towns. Through the various ISIs, DIP should have programs which promote investment, provide training and advisory services for industrial production and management, and organize products exhibitions.

7.28 On technical assistance TISTR should be encouraged to develop a program of R&D and testing services for town industry. These services are available at a fee, which can be met partly by the entrepreneurs and partly by other donors, to be discussed below.

7.29 For both DIP and TISTR to perform the above roles effectively there needs to be a program to upgrade the staff of the two institutions. It should also be pointed out that DIP may want to concentrate on the formulation and supervision of projects, leaving their implementation to other (private) organizations. In that case the staff of DIP should be trained accordingly.

Assistance Programs by Donors

7.30 It is obvious that the programs suggested above can not be met entirely by RTG, because of its limitations on financial as well as human resources. Donor countries and agencies may thus have an important role to play in the rural industrialization process.

7.31 The formulation of rural industrialization strategy may be accomplished by RTG. An adviser may be requested from a donor agency.

7.32 The training of CDD agents to help in the enterprise development at the village level needs assistance from a donor country. USAID is an appropriate agency for RTG to request for assistance on this particular program.

7.33 Investment promotion for town industry should benefit from the USAID's Private Enterprise in Development Project, if the project is designed accordingly. Under the existing project arrangement the BOI has been provided with a grant to promote investment. The BOI should be urged to use part of the grant for the promotion of town industry. In addition DIP has started an investment identification and promotion project in the Northeast, with assistance from UNDP/UNIDO. Similar arrangements could be made for other areas.

7.34 Credit arrangement can be made by RTG. But after the mechanism to make credit from financial institutions more accessible to small enterprises, RTG may request countries like Japan and Repub-

¹ See Narongchai Akrasanee and Associates, "An Industrial Credit Guarantee Scheme for Thailand", Report prepared for the World Bank, January 1983.

lic of Germany to provide low interest loan for small enterprises. These two countries already have such a scheme.

7.35 In the areas of technical assistance and industrial facilitation there are many activities that would benefit from foreign assistance. Firstly a country like Japan should be requested to help build premises for ISIs. Secondly the cost of providing training and advisory services to town industry is usually higher than what the enterprises can afford or are willing to pay, because the personnel are usually from Bangkok. Certain donor countries or agencies should be requested to help subsidize the cost such that it is within the range of the cost of a similar service charged to an urban producer.

7.36 DIP and TISTR would benefit from foreign assistance in their staff training programs and their effort to install appropriate equipments.

7.37 Finally there is a need for foreign assistance in a research program on the relationship among farm, non farm and off-farm activities in different regions. Particularly for USAID these aspects should be incorporated into the Northeast Rainfed Agricultural Development Project and the Rainfed Agricultural Intensification Project.

Annexes

Annex A. — Data of ROFEAP Project

Annex B. — Models of ROFEAP Project

Annex C. — Publications of ROFEAP Project

Annex D. — Services Provided by ROFEAP Project Researchers

ANNEX A

DATA OF ROFEAP PROJECT

Annex A provides information on data which are gathered by the project. These data at present are either in files or magnetic tapes at the Faculty of Economics and Business Administration, Kasetsart University; the Department of Agricultural Economics and Rural Sociology, Ohio State University, Columbus, Ohio; and the Department of Agricultural Economics, Michigan State University, East Lansing Michigan.

These data are survey data which provide information on farm and non-farm activities of firms and households in selected study areas namely; Suphan Buri, Chiang Mai, Khon Kaen and Roi Et. The data are separated into two main sources i.e. town and village data. Data on town are information concerning pattern of production, marketing, finance and management from a sample of 147 firms in selected industries for the period of one year during 1980-1981. Data on villages gather information in more details concerning patterns of production, resource use and finance from a sample of 424 households representing various combinations of farm and non-farm activities for the same period of one year during 1980-1981.

The survey data on town fall into two groups: stock data which have been collected from 5 stock questionnaires administered once on each firm in July, August, October and November 1980 and in February 1981; and monthly data which have been collected from questionnaires administered once each month to cover informations during March 1980 through February 1981.

The survey data on villages fall into three groups: stock questionnaires administered at the beginning of the survey year (and in some cases, once more thereafter); weekly questionnaires administered each week; and monthly questionnaires.

Based on these two survey data, data files have been developed as follows:

- 1) Town stock and monthly raw data
- 2) Village stock raw data
- 3) Village weekly raw data
- 4) Village monthly raw data
- 5) Cash flow analysis (village)
- 6) Net family income analysis (village)
- 7) Wealth and credit analysis (village)
- 8) Labor/employment analysis (village)
- 9) Price variable construction (village)
- 10) Farm modeling (village)

11) Land analysis (village)

12) Labor analysis (town)

Data files number 1 to 4 consist of raw data of all administered questionnaires, whereas data files number 5 to 12 are auxiliary files. These auxiliary files have been generated from raw data stored in data files number 1 to 4.

The description for each data file is as follows:

1) Town stock and monthly raw data

Town stock and monthly raw data are stored in magnetic tapes No. 5259, 2119 and 1714. Data are organized according to firm and within each firm information concerning patterns of production, marketing, finance and management are recorded. Data are collected from stock and monthly questionnaires over one year period starting from March 1980 to February 1981. These questionnaires are administered to cover eight industries i.e. bricks, cement products, fruit and vegetable processing, furniture, ready-made garments, noodles, bean curds, silk and wood crafts which are located in Chiang Mai, Khon Kaen and Roi Et. (See details in Table 1)

Table 1 : FIRMS IN TOWN SURVEY SAMPLE, BY LOCATION

	Chiang Mai			Khon Kaen			Roi Et	Total
	Muang	San Kamphaeng	San Pa Tong	Muang	Ban Phai	Chon- nabot	Muang	
1. Bricks	3	—	—	—	—	—	—	3
2. Cement products	9	—	2	3	2	—	3	19
3. Fruit & Vegetable processing	8	—	—	—	—	—	—	8
4. Furniture	8	—	—	5	3	—	3	19
5. Ready-made garments	10	14	—	4	1	—	—	29
6a. Noodles	4	—	—	3	2	—	5	14
6b. Bean curds	4	—	—	3	1	—	1	9
7. Silk	—	—	—	—	6	29	—	35
8. Wood crafts	8	3	—	—	—	—	—	11
Total	54	17	2	18	15	29	12	147

2) Village stock raw data

All data from the village stock questionnaires are placed in a magnetic tape number 0956. These data are sorted at first by household and within each household contains information according to the stock questionnaires. (See Table 2 on the questionnaire structure used in village survey). Since

Table 2 : QUESTIONNAIRE STRUCTURE : PHASE II VILLAGE SURVEY

Code Subject	Stock	Weekly	Monthly
10's Labor ^a	S-10: Household members S-11: Permanent hired workers not living in household, and apprentices	W-10: Weekly summary, household members, permanent hired workers and apprentices (those covered by S-10 and S-11) W-11: Temporary hired workers and exchange labor	
20's Outputs	S-20: Output over previous year and current inventory: farm enterprises S-21: Same, non-farm enterprises	W-20: Weekly output (farm and non-farm together; includes livestock)	M-20: Monthly output (farm and non-farm together; includes livestock. Based on data in W-20 questionnaires, plus an interview).
30's Inputs	S-30: Input used over previous year, and current inventory: farm enterprises S-31: Same, non-farm enterprises	W-30: Weekly input data (farm and non-farm together).	M-30: Monthly inputs (farm and non-farm together. Based on data in W-30)
40's Capital Assets	S-40: Land owned or rented in by household S-41: Land operated by hh. S-42: Buildings S-43: Equipment owned by farm S-44: Same; non-farm S-45: Vehicles and consumer durables owned by hh. S-46: Livestock	W-43: Machinery and equipment and animals for power used by hh. during week: farm and non-farm together (weekly use of assets covered by S-43, S-44, S-45, and S-46)	
50's Financing	S-50: Stock of financial assets and number of loans outstanding S-51: Details of loans outstanding on survey day		M-51: Monthly loan repayment activities M-52: Monthly borrowing activities

Table 2 : (continued)

Code Subject	Stock	Weekly	Monthly
60's income, Cash Flow; capital Assets (Reinter- views, Stock Question- naires)	S-60: Revised version of S-40 given 10/80		M-60: Monthly cash received by hh.
	S-61: Revised version of S-41 given 10/80		M-61: Monthly hh. non-consumption expenses
	S-62: Code sheet for hh's yearly cropping pattern for plots 1-5		M-62: Monthly hh. consumption expenses
	S-63: Code sheet for hh's yearly cropping patterns for plots 6-10		
	S-64: Yearly cropping patterns for plots 1-6		
	S-65: Yearly cropping patterns for plots 7-12		
70's Labor (Reinter- views)	S-70: Movement of members in and out of hh. since S-10		
	S-71: Movement of permanent workers in and out of hh. since S-11		
	S-72: Movement of apprentices in and out of hh. since S-11		

^aThere is also another form; HH-10, which is left in the household each week for daily recording of economic activities of each household etc.....

there are three sets of stock questionnaires which are administered in different time periods, each set of questionnaire therefore describes different information on village household. The first set of 14 stock questionnaires are administered in four successive weeks during February 1980. These questionnaires gather information concerning the characteristics of labor, land, other assets of the household and patterns of production over the preceding 12 months. The second set of 7 stock questionnaires are carried out in October 1980. Five of these questionnaire provide up-dated information concerning household members, employees, land ownership and land use in the sample households. The remaining two sets of questionnaires collect data concerning cropping patterns, plot by plot over a 22-month period starting with the rainy season before the project start (June 1979) and concluding with the dry season after the end of the survey (March 1981). The last set of 5 stock questionnaires are conducted at the end to February 1981. These questionnaires gather data concerning assets owned by the households. These three sets of stock questionnaires are undertaken in villages located in Chiang Mai, Khon Kaen, Roi Et and Suphan Buri (See details in Table 3).

Table 3 : SUMMARY OF VILLAGES IN WHICH HEADMAN INTERVIEWS WERE UNDERTAKEN

Region/Province	District	Subdistrict	No. of Headmen Interviewed
North/Chiang Mai	Muang	Mae Hia	2
		Hang Dong	1 ^a
		San Kamphaeng	3
	San Pa Tong	Buag Khang	2
		On Nua	1
		Rong Wa Dong	2
		Ban Kaat	1
		San Klang	4
		Ban Mae	2
		Tung Satok	5
Northeast/Khon Kaen	Muang	Samran	3
		Sawati	2
		Don Hun	3
		Muang Kaw	3
		Ban Tum	1
	Ban Phai	Koksamran	2
		Ban Poa	2
	Chonnabot	Chonnabot	2
	Nam Phong	Ta-Kraserm	2
		Wang Chai	2
	Namphong	2	
Northeast/Roi Et	Muang	Sa-ardsomboon	4
		Papha	3
		Nua-Muang	2
		Nong-Wang	1
		Poa Pan	1
	Chaturaphak-Phiman	E-Ngong	3
		Nong Mung	1
		Nam-Sai	1
Central/Suphan Buri	Muang	—	—
	Don Chedi	Rairot	5
		Donchedi	3
		Srakrachom	3
Total			74

^a Village located just outside the muang district.

3) Village weekly raw data

All data from the village weekly questionnaires are stored in a magnetic tape number 2172. These data are sorted at first by week, then by household, and within each household contains informations on labor use, output, input, and machinery and equipment use. These village weekly raw data are for one survey year during March 1980 to February 1981.

4) Village monthly raw data

All data from the village monthly questionnaires are stored in a magnetic tape number 1950. These data are recorded at first by month, then by household, and within each household, there are informations on labor use, output, input and machinery and equipment use. Since the village monthly raw data are based on the weekly ones, the production and input figures should be consistent between the four (or five) weeks and the monthly total. But in some areas, i.e. the patterns of use and sale of output, the monthly data go beyond the weekly data in details. These data are collected every month during the first week of each month from March 1980 to February 1981. (See details in Table 4).

Table 4 : SCHEDULE OF SURVEY MONTHS

No.	Month	First Day of the Month	Last Day of the Month	Number of Weeks in Month
1	March, 80	Sun., Mar. 2	Sat., Mar. 29	4
2	April, 80	Sun., Mar. 30	Sat., May 3	5
3	May, 80	Sun., May 4	Sat., May 31	4
4	June, 80	Sun., June 1	Sat., June 28	4
5	July, 80	Sun., June 29	Sat., Aug. 2	5
6	August, 80	Sun., Aug. 3	Sat., Aug. 30	4
7	Sept., 80	Sun., Aug. 31	Sat., Sept. 27	4
8	Oct., 80	Sun., Sept. 28	Sat., Nov 1	5
9	Nov., 80	Sun., Nov. 2	Sat., Nov. 29	4
10	Dec., 80	Sun., Nov. 30	Sat., Jan. 3, 1981	5
11	Jan., 81	Sun., Jan. 4	Sat., Jan. 31, 1981	4
12	Feb., 81	Sun., Feb. 1	Sat., Feb. 28, 1981	4

5) Cash flow analysis (village)

The cash flow analysis data file is the subsequent computer-assisted analysis of village questionnaire data. In this file, the monthly cash flow analysis report is constructed for each household. It represents sources and use of cash, calculates the resulting cash surplus and deficit at the end of the month, and evaluates the impact of any surplus or deficit on cash and loan balances and financial instruments. One table is produced for each village per month in the study, with individual households in columns and means for the village in the last column.

6) Net family income analysis (village)

The net family income analysis data file is also the subsequent computer-assisted analysis of village questionnaire data. The data file consists of monthly net family income data for each household. It describes also monthly sources and uses of family net income. On sources of family income, the data are classified as income from farm, non-farm and off-farm employments. Again these data of each table is produced for each village per month, with variables on the rows and separate households running down the columns, and means for the village in the last column.

7) Wealth and Credit analysis (village)

This data file records the monthly credit profile data of each household. Moreover, for each household per month, there are 247 calculated supplementary variables.

8) Labor-Employment analysis (village)

Characteristics of labor and employment in the village are investigated and the data are recorded in magnetic tapes number 1 and 2. There are both weekly and monthly employment records.

The data which have been collected week-by-week include employment rates, actual hours worked and excess labor supply for each person in the household. The same data are also stored at the household level. The people in each household are separated into 5 groups: family labor, hired-labor of family member, apprentice of family member, hired or temporary workers and free paid or exchange labor. For each group, the data are presented for different age groups, sex and farm versus non-farm activities.

Monthly data use the same labor group breakdown as the weekly one for each labor group. there are data on 25 calculated variables. These variables sum hours worked by each worker, wages paid, people in each group, sex, farm, non-farm and off-farm activities. There is also a summation on each variable calculated over all months for the households, and a similar summation over all households in each village.

Besides, there are data on household members who move into the household during the wet season. These data provide information concerning mobility of labor during the wet and dry seasons.

9) Price variable construction (village)

This file consists of data on average prices of inputs bought and products sold by each household. However, these data are recorded for month-by-month only.

10) Farm modeling (village)

All data used in modeling of farm activity by linear programming techniques are recorded. Most data are obtained from the questionnaires of the following codes: S10, S50, M20, M61 and M62. (See details in table 2)

11) Land analysis (village)

This data file provides data on land owned and operated or rented by the household in the wet season.

12) Labor analysis (town)

This data file stores a group of supplementary variables for each firm per month of the survey year. These variables are summed by month over all firms in each industry, then over all industries in a province.

More details on codes and variables contain in each file data or magnetic tape are given in Handbook of Procedures for Using the Ohio State University ROFEAP Data Set. This book has been compiled for the Department of Agricultural Economics and Rural Sociology, The Ohio State University and is available for reading at the same place. Besides a copy of the same book is available at the Center for Applied Economics Research, Kasetsart University for users of the ROFEAP data in Thailand.

ANNEX B

MODELS OF ROFEAP PROJECT

ROFEAP project uses several models to analyze the relationship between farm and non-farm activities. These models are developed based on two major methods namely linear programming and regression analysis.

Linear programming technique is utilized in the following models.

- Model to estimate seasonal credit needs of non-farm firms;
- model of employment in kenaf, cassava and sugar cane production and processing in northeast, Thailand;
- farm household model in Roi Et province;
- farm household model in Chiangmai;
- rainfed farm household modeling in Khon Kaen;
- irrigated farm household model in Khon Kaen.

Regression analysis is utilized in the following models.

- The off-farm labor supply of a household model;
- the effect of off-farm employment on the structure and the distribution of income model.

Description of these models are as follows.

The generalized linear programming model to estimate seasonal credit needs of non-farm firms.

The linear programming model uses to estimate seasonal credit needs of non-farm firms is expressed as follows:

$$\begin{aligned} \text{Max: } & - \sum_t \sum_i b_{it} X_{it} + \sum_t \sum_i p_{it} S_{it} + \sum_t \sum_i p_{it}^1 T_{it} - \sum_t S C_t \\ & - \sum_t USC_t - \sum_t OHC_t - \sum_t TAX_t - \sum_t \sum_j IP_{jt} + \sum_t IR_t - \sum_t IL_t \end{aligned}$$

Where:

- t = period t
- i = product i
- j = source of borrowing j
- X_{it} = production of product i in period t
- S_{it} = cash sales of product i in period t
- T_{it} = credit sales of product i in period t
- SC_t = cost of hiring skilled labor in period t
- USC_t = cost of hiring unskilled labor in period t
- OHC_t = overhead cost expenses in period t
- TAX_t = tax expenses in period t
- IP_{jt} = interest payment to source j in period t
- IR_t = interest income in period t
- IL_t = interest payment on outstanding long-term debt in period t
- b_{it} = cash cost of raw material per one unit of product i in period t
- p_{it} = cash price of product i in period t
- p_{it}^1 = credit price of product i in period t

subject to:

$$(1) \text{ For each } i \text{ and } t: \sum_t X_{it} - \sum_t S_{it} - \sum_t T_{it} \leq B_i - A_i$$

where:

- B_i = maximum amount of product i which can be kept in inventory
- A_i = initial inventory of product i at the beginning of the first period.

$$(2) \text{ For each } i \text{ and } t: - \sum_t X_{it} + \sum_t S_{it} + \sum_t T_{it} \leq A_i$$

$$(3) \text{ For each } i \text{ and } t: - S_{it} + C T_{it} = 0$$

where:

- C = ratio of quantity sold of cash sales to quantity sold of credit sales

(4) For each i and t : $S_{it} + T_{it} \leq D_{it}$

where:

D_{it} = maximum quantity of product i which is expected to sell in period t

(5) For each period t : $\sum_i A_{it} X_{it} - SKR_t = 0$

where:

A_{it} = man-day of skilled workers required in the production of one unit of product i in period t

SKR_t = skilled labor required in period t

(6) For each period t : $-W_t SKR_t + SC_t = 0$

where:

W_t = wage rate per man-day of skilled workers in period t

(7) For each period t : $\sum_i A_{it}^l X_{it} - USKR_t = 0$

where:

A_{it}^l = man-day of unskilled workers required in the production of one unit of product i in period t

$USKR_t$ = unskilled labor required in period t

(8) For each period t : $-W_t^l USKR_t + USC_t = 0$

Where:

W_t^l = wage rate per man-day of unskilled worker in period t

(9) For each machine in each period t : $\sum_i X_{imt} \leq MA_{mt}$

where:

X_{imt} = production of product i using machine m in period t

MA_{mt} = maximum amount which can be produced by machine m in period t

(10) For each period t : $\sum_i (ohc)p_{it} X_{it} - OHC_t = 0$

where:

ohc= overhead cost per one baht of value of production

$$(11) \text{ For each period } t: \sum_i t p_{it} S_{it} + \sum_i t p_{it}^l T_{it} - TAX_t = 0$$

where:

t = tax rate

$$(12) \text{ For each period } t: DIV_t = C_t$$

where:

DIV_t = dividend payment in period t

C_t = dividends the firm has to pay in period t

$$(13) \text{ For each period } t: IL_t = I_t$$

where:

I_t = interest on outstanding long-term debt the firm has to pay in period t

$$(14) BEC_1 = IC_1$$

where:

BEC_1 = initial cash on hand at the beginning of period 1

IC_1 = cash on hand the firm has at the beginning of period 1

$$(15) PLTD_n = P_n$$

where:

$PLTD_n$ = principal repayment of outstanding long-term debt in period n

P_n = of outstanding long-term debt the firm has to repay in period n

$$(16) SD_1 \geq 0$$

where:

SD_1 = savings deposit in period 1

$$(17) BOR_{jl} \leq Y_{jl}$$

where:

BOR_{jl} = borrowing from source j in period 1

Y_{jl} = maximum amount of loan which the firm can borrow from source j in period 1

$$(18) \text{ For each } t: \sum_j BO_{jt} \leq M$$

where:

BO_{jt} = short-term debt outstanding at sources j in period t

M = maximum level of outstanding short-term debt which the firm can borrow without jeopardizing financial position

$$(19) \text{ For each } t = 2, \dots, n: IR_t - (R)SO_{t-1} = 0$$

where:

SO_t = savings outstanding in period t

R = rate of interest on savings account

$$(20) \text{ For each } t = 2, \dots, n: SW_t - SO_{t-1} \leq 0$$

where:

SW_t = savings withdrawal in period t

$$(21) \text{ For each } t = 2, \dots, n: SD_t \geq 0$$

where:

SD_t = savings deposit in period t

$$(22) \text{ For each } t = 2, \dots, n: SO_t - SD_t - SO_{t-1} + SW_t = 0$$

$$(23) \text{ For each } t = 2, \dots, n: IP_{jt} - r_j BO_{jt-1} = 0$$

where:

r_j = rate of interest on capital borrowed from source j

$$(24) \text{ For each } t = 2, \dots, n: REB_{jt} - BO_{jt-1} \leq 0$$

where:

REB_{jt} = repayment of short-term debt to source j in period t

$$BO_{j1} = BOR_{j1}$$

$$SO_1 = SD_1$$

$$(25) \text{ For each } t = 2, \dots, n: \text{BOR}_{jt} - \text{REB}_{jt} + \text{BO}_{jt-1} \leq Y_{jt}$$

where:

BOR_{jt} = short-term borrowing from source j in period t

$$(26) \text{ For each } t = 2, \dots, n: \text{BO}_{jt} - \text{BOR}_{jt} + \text{REB}_{jt} - \text{BO}_{jt-1} = 0$$

$$(27) \text{ For each } t: \sum_i d_t b_{it} X_{it} + \sum_i d_{t-1}^1 b_{it-1}^1 X_{it-1} - \sum_i P_{it} S_{it} \\ - \sum_i p_{it-1}^1 T_{it-1} + \text{SC}_t + \text{USC}_t + \text{OHC}_t + \text{TAX}_t + \text{DIV}_t \\ + \text{IL}_t - \text{IR}_t - \text{SW}_t + \text{SD}_t + \text{IP}_{jt} + \text{REB}_{jt} - \text{BOR}_{jt} \leq 0$$

where:

d_t = percentage of cash purchases of raw materials in period t

d_t^1 = percentage of credit purchases of raw materials in period t

b_{it}^1 = credit cost of raw material per one unit of product i in period t

Model of employment in kenaf, cassava and sugar cane production and processing in northeast, Thailand.

Linear programming technique is used to represent employment of upland crops in the north-east area. The important variables in the model are portion of upland and paddy land, labor resource, source of supply of each crop and water availability for kenaf retting. Additionally, the distance of the farms from the kenaf pulp mill and the sugar refinery are also taken into consideration.

Two models are developed for this study. The first model represents the farming of upland crops in the area where most of the farmers grow sugar cane and cassava and the farms do not have much access to water for kenaf retting.

The second model represents the farming of upland crops in the area where most of the farmers grow heavily kenaf and cassava.

Both models specify objective functions to maximize the household net income obtained from farm and non-farm enterprises subject to a series of constraints i.e. land, family labor, hired labor, initial cash on hand, capital borrowing, capital pay back, planting area and minimum rice consumption.

Farm household models

All the farm household models use poly-period linear programming technique to develop each model which represents farm household in Chiang Mai, Roi Et and Khon Kaen. Each model contains the usual farm enterprise of rice production and several major non-farm enterprises found in the survey villages. In addition, off-farm work is included in order to test the complementarity and competitiveness of farm and off-farm employment. The model divides into 12 periods, that is from the beginning period of May to the end period of December.

The model consists of three parts: objective function, activities and constraints. The objective function in this model is to maximize the household net income obtained from a variety of farm and non-farm enterprises subject to a series of resource constraints i.e. land, family labor, hired labor, initial capital, borrowed capital, loan payback, household expenditures and minimum rice consumption.

The off-farm labor supply of household model

The general analytical model underlying the study of rural household labor supply for off-farm work in Thailand postulates that the off-farm labor supply in rural areas is influenced by wage rates, income variables, environmental variables and farm characteristics. Two models, labeled Model 1 and Model 2, represent all males working in the family and all females working in the family, respectively. Each model was further broken down into three submodels, creating six models in all. These basic models are presented below.

Model 1: Male Off-Farm Labor Supply (Lom)

$$\text{Model 1.1: } Lom = f (Wom, e_1)$$

$$\text{Model 1.2: } Lom = f (Wom, Wof, W_f, W_{nf}, UEI, e_2)$$

$$\text{Model 1.3: } Lom = f (Wom, Wof, W_f, W_{nf}, UEI, FSZ, ASST, MCI, ADLT, EDC, DEP1, DEP2, DEP3, DEP4, NFEN, DIST, e_3)$$

Model 2: Female Off-Farm Labor Supply (Lof)

$$\text{Model 2.1: } Lof = f (Wof, e_4)$$

$$\text{Model 2.2: } Lof = f (Wof, Wom, W_f, W_{nf}, UEI, e_5)$$

$$\text{Model 2.3: } Lof = f (Wof, Wom, W_f, W_{nf}, UEI, FSZ, ASST, MCI, ADLT, EDC, DEP1, DEP2, DEP3, DEP4, NFEN, DIST, e_6)$$

Variable definitions and hypotheses for each independent variable are shown in Table 1. The regression model was estimated for each of the two dependent variables Lom and Lof for each of the three submodels corresponding to their wage rates, income variables, and environmental and farm characteristic variables.

Table 1 : SUMMARY OF A VARIABLES USED IN THE EMPIRICAL MODELS

Variable	Symbol	Unit	Description	Hypothesized Sign	
				Lom	Lof
Males Work Off-farm	Lom	Day	The Natural Log of the Total Number of Days Worked Off-farm for Wages by Males During the Year		
Females Work Off-farm	Lof	Day	The Natural Log of the Total Number of Days Worked Off-farm for Wages by Females During the Year		
Male Wage Rate	Wom	₦/Day	The Natural Log of the Off-farm Wage and Salary Earnings Per Day by Males		
Female Wage Rate	W _{of}	₦/Day	The Natural Log of the Off-farm Wage and Salary Earnings Per Day by Females		
Farm Earnings	W _f	₦/Day	The Natural Log of the Imputed Earnings Per Day of On-Farm Agricultural production	-	-
Non-Farm Earnings	W _{nf}	₦/Day	The Natural Log of the Imputed Earnings Per Day of On-Farm Non-Farm Production	-	-
Unearned Incomes	UEI	₦/Day	The Natural Log of the Interest, Rental, Transfer Payment and Other Non-Labor Farm Activities Income	-	-
Farm Size	FSZ	Rai	The Natural Log of the Area of Land under Cultivation	-	-
Farm Assets	ASST	₦/ Rai	The Natural Log of the Value of Farm Tools and Equipment Per Rai	+	+
Multiple Cropping Index	MCI	Percent	The Natural Log of the Index of Cropping Intensity	-?	-?
Number of Adults	ADLT	Person	The Natural Log of the Working Members of the Family with Ages of 15-65 Years	+	+
Education	EDC	Year	The Natural Log of the Average Years of Schooling Completed	+	+

Table 1 : SUMMARY OF A VARIABLES USED IN THE EMPIRICAL MODELS (continued)

Variable	Symbol	Unit	Description	Hypothesized Sign	
				Lom	Lof
Number of Dependents					
Age 0 - 3	DEP 1	Person	The Natural Log of the Number of Children in a Family Age 0-3 Years	-	-
Age 4 - 6	DEP 2	Person	The Natural Log of the Number of Children in a Family Age 4-6 Years	-	-
Age 7 - 11	DEP 3	Person	The Natural Log of the Number of Children in a Family Age 7-11 Years	-	-
Age 12 - 14	DEP 4	Person	The Natural Log of the Number of Children in a Family Age 12-14 Years	-	-
Non-Farm Enterprise	NFEN	1 or 0	Dummy variable : 1 if Non-Farm Enterprise Exists within Village; Otherwise 0	-?	-?
Commuting Distance	CDIS	Km	The Natural Log of the Distance of the Village to Muang District	-	-
	e_i	-	Disturbance Term ($i = 1, 2, \dots, 6$)		

The effect of off-farm employment on the structure and the distribution of income model

A regression function which explains the relationship between net family income of farm household and factors associated with household is written as below:

$$Y_i = b_0 + \sum_{j=1}^n b_j X_{ij} + e_i$$

This model explains that Y_i represents the net family income of farm household which is the dependent variable in this study; X_{ij} 's are factors or the independent variables associated with household i , namely total man-days, farm man-days, current value of fixed capital, age and education of household head, number of household member, credit for production, expenditure on fertilizer and insecticide, and the status of land owner or land renter. The b_0 , b_j 's and e_i are the constant term, estimated parameters and error term respectively.

Another set of regression functions is to determine the relationship between off-farm and farm incomes with a hypothesis that the change in these two kinds of incomes will be in the contrasting direction. The equation is a simple linear regression as:

$$Y = a + bX$$

where Y is the ratio of total off-farm income to total family income and X is the farm income. a and b are the constant term and the estimated coefficient of which the latter is expected, to be negative.

ANNEX C

PUBLICATIONS OF ROFEAP PROJECT

Annex C lists out the publications of Rural Off-Farm Employment Assessment Project which have been prepared by the Center of Applied Economics Research. These publications include research papers, conference papers, working papers and monograph. In addition, synopsis is provided for every research paper and for selected conference and working papers which deal with the subjects not covered in the research papers.

Research Papers

- No. 1 Tongroj Onchan, Pradit Charsombut, Richard L. Meyer and Donald C. Mead, "Description of the Rural Off-Farm Employment Assessment Project in Thailand", October, 1979.

The objective of the Project is to provide data and analysis needed to identify and develop appropriate projects and policies to assist in the expansion of non-farm employment and income opportunities in the rural areas and market town in Thailand. The Project is planned to cover three major components: rural non-farm enterprises, farm level surveys and rural financial markets. Each is discussed with some of the issues to be studied and general research methodology. The Project is going to conduct survey on firms and households located in selected provinces in the north, the Northeast and the Central areas. Besides the studies, the Project will include also a technical assistance component, a series of conferences and workshops, and development of future project.

Secondly, the paper outlines the project implementation, involving implementing agencies and implementation schedule of the Project.

Lastly, the paper presents details on evaluations of the Project which will assess the progress of the studies and analyses being conducted.

- No. 2 Donald C. Mead and Pradit Charsombut, "Rural Off-Farm Employment in Thailand: Phase I Survey Results", June, 1980.

This paper provides information needed for the Phase II survey of the Project. Regarding information on the villages the paper gives the framework for selection of both villages and individual households for more detailed and comprehensive Phase II surveys. For information on towns, the paper provides a detailed list of all firms in each town covered, as well as information about the characteristics of each firm.

In addition the paper covers important information concerning pattern of agricultural activities in the areas studies and the types of non-agricultural pursuits in which village and rural town households are engaged.

- No. 3 Donald C. Mead and Richard L. Meyer, "Rural Off-Farm Employment Surveys: Approaches and Methodology", May, 1981.

This paper describes the methodology employed in the Project for village and town surveys. The village survey is on selected households representing various combinations of farm and non-farm activities, and on detailed information concerning pattern of production, resource use and finance. The town survey is a monthly survey on selected firms to collect information concerning employment, production and sales. The monthly information is supplemented by additional five surveys to capture more detailed information about particular aspects of the firms entrepreneurship, marketing, production costs, labor force and finance. Both village and town surveys are administered over a period of one year.

The problems on village survey are concerned with the field supervision of enumerators, to ensure a consistently high quality of data and the processing of this vast amount of data. The problem on town surveys is the increasing reluctance on the part of the respondents to accept the intrusion by enumerators on their time and their privacy and costly procedures for channeling all informations from the town surveys.

The surveys of village and town provide information needed to identify and develop appropriate policies and programs for the rural and non-farm sectors.

No. 4 Tongroj Onchan and Yongyuth Chalamwong, "Rural Off-Farm Employment and Income of Rural households in Thailand: Some Research Findings, October, 1981.

This paper provides information on poverty and income distribution of the Thai farmers in the rural areas. The paper describes that their incomes tend to increase overtime at a very low rate and their income distribution is very unequal. The low income farmers are usually those who own small-size farms, who are tenants and who are rice or upland crop farmers in the rainfed area.

The paper finds that a considerable portion of family income is from non-farm employment. In some areas, it accounts for over 50 percent of the total family income. It is also interesting to note that non-farm income constitutes a greater proportion of the total income of small farmers. It is also found that non-farm income helps stabilize family income over the 12-month period. Besides, non-farm income tends to equalize the distribution of income among farmers.

The paper argues that government policies and programs designed and implemented to solve income problem of the rural people have not been of much success. New concepts and new strategies of government policies have to be set up with programs especially designed for the target groups. The target groups have to be systematically identified and efforts must be seriously made to better understand their conditions and problems. Moreover, the policies should be designed to have an effect on both demand and supply of the rural non-farm employment.

No. 5 Donald C. Mead, "Subcontracting in Rural Areas of Thailand", November, 1981.

This paper provides a brief discussion of how subcontracting arrangement operates and a survey data on people engaged in subcontracting work in the production of ready-made garments, silk, wood carving, fish nets and knitting. The people are engaged in a variety of activities and spend substantial amount of time in agriculture during the period of planting and harvesting. But seasonal variation in agricultural works does not affect wage rates of subcontract workers, which are reported to be very low.

Advantages of subcontracting work are flexibility working time, provision of technical, marketing and financial assistance by parent firms, and reduction in social and economic costs of urbanization, some disadvantages identified are lack of suitable rules and regulations, and risks of exploitation.

To promote the subcontracting system the paper suggests that promotion programs based on government sector or a private organization with one or two effective promoters for each program are needed. Moreover, taxation and regulation which are appropriate for the subcontracting system should be introduced.

No. 6 Merle Menegay and Nittaya Wongtada, "The Fruit and Vegetable Processors of Northern Thailand-Focus on Traditional Pickling and Preserving Firms", June, 1981.

This paper is an analysis on the longitudinal survey from a sample of pickling firms in Chiang Mai. The industry is reported to be very seasonal both in sales of the product and purchases of raw materials. The timing of seasonality of the sales and purchases caused considerable cash flow problems for certain types of processors. Moreover, the monthly variation in supply of raw materials results in a very dynamic change in price, which is the most frequently mentioned problem. Another problem related to raw materials is the high rate of spoilage after having been in storage for a certain period of time. Other than high prices and quality problems for raw materials, working capital is of major concern especially for those firms which have money tied up in large inventories of final product and in account receivable from the retailers they supplied.

The technology used in the pickling process is relatively simple which extends back for several generations and requires no machinery except water pump. Laborers work in the industry are mostly family members with few hired workers, permanent or temporary of non-skilled labor or at best semi-skilled labor. The major functions undertaken by family members include marketing, management of the production process, basic record keeping and participation in the production and packaging processes while works that can not be handled by them are done by hire labours. The payment for the hire labor is on a daily wage basis. The paper argues that the payment should be on a unit daily basis to improve labor productivity and to lessen absenteeism.

The paper also points out several issues on the industry i.e. comparative labor productivity per man day in Bangkok and Chiang Mai, barriers to entry, profitability and product flexibility.

The policy and program actions which may be helpful to the industry include: to identify the types and amount of new preserved fruit and vegetable products preferred by the Thai consumer, to resolve various technical problems encountered by the industry; to specify government regulation regarding health standards, to provide informations on close substitute use of chemical ingredient, to indicate on opportunity for expansion in related industry and to initiate changes or to improve the management of these types of small firms.

No. 7 Somsak Priebprom, "The Role of Farm, Non-Farm Enterprises and Off-Farm Work in Household Employment and Income Generation on Irrigated and Rainfed Farms, Khon Kaen, Thailand", July, 1982.

This paper provides more detail on non-farm and off-farm activities and their relationship to farm activities in both rainfed and irrigated areas in Khon Kaen province. It describes also the role of non-farm enterprises and off-farm work on rural household employment and income.

The paper reveals that non-farm enterprise as well as off-farm employment are a part of farm household's way of life along with farming even in the areas of more intensive farming systems. Non-farm enterprises i.e. sericulture, silk weaving, sticky rice container making, mat making, cotton weaving and basket making and off-farm employment generate a significant amount of income and employment. The degree of income and employment provided by non-farm and off-farm employment however varies according to farm size and type of activities engaged in rainfed or irrigated area. Moreover, the paper reports that the roles of men, women and children are different among the types of

enterprise and among activities performed within enterprise and also by the farming situation (i.e., rainfed or irrigated).

The implication of the paper for the rainfed area is to promote both non-farm and off-farm works in the rural areas and for irrigated area is to promote higher crop intensification to increase income and employment.

No. 8 Somsak Priebprom and Warren H. Vincent, "Combining Farm and Non-farm Labor Employment Opportunities for Improving Income and Employment on Rainfed Farms Khon Kaen, Thailand", August, 1982.

This paper develops a poly-period linear programming model for a rainfed farm household in Khon Kaen. The model is used to analyze the effect of non-farm household enterprises and off-farm employment on household income, and on the use of labor and other resources. In addition a simulation exercise is carried out based on certain sets of assumptions.

The programming solutions demonstrate that giving loans to rainfed farmer is not very risky since they will still be able to obtain enough family net income for saving at the production level as much as a 20 per cent below the average normal crop yield of rice. In order for the rainfed farm households to attain maximum annual family income, the paper suggests that the households should combine activities on farm, non-farm and off-farm employment. Female households, should work off-farm on a part time basis if employment opportunities exist and skill workers should perform silk weaving activities while the unskilled ones should be engaged in mat making activities. Other suggestions of the paper are that the rainfed farmers should produce glutinous rice only for family consumption and non-glutinous rice for commercial sales; the large farm households should hire in many hours of both male and female labor especially during the peak periods of rice production; and the households should engage in two additional production periods for sericulture.

The paper also suggests areas for further research including: identifying additional potential crops for rainfed farms in the rainy seasons and new product development in the area; providing more information on the economics of individual non-farm enterprises regarding technology and marketing and developing further on the research methodology.

No. 9 Saroj Aungsumalin, "The Generalized Linear Programming Model to estimate Seasonal Credit Needs of Non-Farm Firm", August, 1982.

This paper develops and presents a generalized linear programming model to analyze seasonal credit needs. The description of the model starts with the assumptions which provide the general setting of the markets and the behaviour of the firm, the objective function the activities and the constraints. The objective function of the firm is assumed to maximize return to fixed assets, family labor, and equity capital subject to the following constraints: inventory, demand, credit sales, machinery, cash needed to hire skill labor, unskill labor, to pay for overhead cost, to pay for taxes, to pay for dividends interest payment and principal repayment of outstanding long-term debt, savings, borrowing, initial cash on hand and cash balance. The activities are divided into four groups, i.e., production, selling, labor hiring and financial activities. The mathematical model is then presented followed by the LP tableau.

From the model the following variables are determined: (1) production flow by product and by period; (2) accumulation and liquidation of inventory of product by product and by period; (3) amount sold in cash and on credit by product and by period; (4) the use of machinery by product and by period; (5) the use of labor and labor cost of skill and unskill labor by period; (6) tax, dividends, overhead cost, interest payment and interest income by period; (7) borrowing, repayment, and out-

standing by source and by period; (8) savings deposit, withdrawal, and balance by period; and (9) net return to fixed assets, family labor, and equity capital.

No. 10 Saroj Aungsumalin and Warren H. Vincent, "Seasonal Credit Needs of Cement Product Firms in Rural Thailand", August, 1982.

The paper presents an attempt to model the cash flow situation of cement product firms, and to relate this to short-term credit demand. It recommends that lending and establishment of ceilings should be based on the proforma cash flow of the firm, the income statement, and the balance sheet. This subject is also treated extensively in a dissertation written by Saroj Aungsumalin: "The Use and Productivity of Short-term Credit in Small Scale Cement and Ready-Made Garment Firms in Thailand", Michigan State University, 1982.

No. 11 Yongyuth Chalamwong, "Development of Cottage Industries, Female Labor Force Participation, and Human Fertility in Rural Thailand", August, 1982.

The paper examines the impact on human fertility of the development of cottage industries through female labor force participation in the rural areas. The framework used includes consideration of the interrelationship of female labor force participation with human fertility.

To-examine the simple relationships between female labor force participation in cottage industries and fertility, the simple cross-tabulation is used. It is found that women who work solely in agriculture have the highest fertility rates among those who work in small cottages industries and those who work for wages. Regarding the relationship between land and fertility, land ownership status is shown to have clearly positive association with fertility; land quality shows no consistent pattern of association with fertility and land size shows unclear relationship with fertility. The relationship between income and fertility also shows no consistent pattern.

Simultaneous linear equation models are used to examine: a) the importance of sources of labor force participation by non-farm activities and fertility; b) the importance of female labor force participation in wage labor and fertility; c) the importance of the development in cottage industries which influences allocation of time of female participation in such activities and fertility; and d) the total hours worked in all activities and fertility. The results of all those models indicate the importance of the effect of women's labor force participation, especially in small cottage industries upon fertility.

The results are expected to be helpful in policy and program on population. In order to reduce fertility, the government should consider actions which have effect upon income of the family, female labor force participation, an increase in land size, and land improvement.

No. 12 Sungvean Chanthongkaew, "Hand Tools Industry in Roi Et and Chiang Mai", August, 1982.

Relatively low returns to labor in some areas are a function of the availability of steel and charcoal, and technologies in current use. Efforts to improve output and income will require introduction of better equipment and machinery, removal of input constraints, and provision of credit to finance the shift in technology.

No. 13 Vachira Vichaiwattana, "Factors Affecting the Supply for Off-Farm Work in Rural Thailand", August, 1982.

This paper examines factors affecting the supply for off-farm work in rural areas. Regression models are used to determine the effects of various factors. The results of the models show that signi-

ficant variables which explain off-farm work of male and female are off-farm wage rate, farm and non-farm earnings, number of adults, and number of dependents aged 0-5 years.

The policy implication of this paper is that the government should promote off-farm activities in the rural areas by developing rural public work programs which will induce more off-farm work, improve off-farm labor productivity by means of increasing skill for labor, and encourage rural cottage industries. However, at the same time the government should not neglect to promote and develop farm works in the rural area by improving farm productivity.

No. 14 Yongyuth Chalamwong and Richard L. Meyer, "Farm Household Income Levels, Sources and Patterns in Selected Thai Village", August, 1982.

This paper is an analysis on income situation of villages and households sampled in the Project. The sample consisted of 424 farm households from the four provinces of Chiang Mai, Khon Kaen, Roi Et and Suphan Buri. The survey data obtained from this sample covered the period starting March 1980 and ending February 1981.

The paper firstly presents the household income data on regional averages and a comparison of this regional income made with the estimation of the World Bank. The income estimates of the paper show that the highest average incomes are found in the Central region, which has the most favourable farm production conditions, and the lowest incomes are found in the Northeast with poorest production possibilities. However, the income estimates reported in the paper are higher than the estimates of the World Bank, which is perhaps due in part to sampling differences, and farm household income growth rates that were higher than the inflator used with the Bank data.

The paper secondly presents average village incomes which are also compared with the poverty line calculations of the World Bank. Selected characteristics of villages above and below the poverty line are also presented with special emphasis on the sources of income. An effort is made to detect patterns in sources of village income as a possible explanation for the levels of income observed. However, the paper finds that Thai villages are extremely complex and heterogenous with respect to the levels, source and patterns of income received by farm households. Considering the total net household income reported in all villages, about 35 percent came from farm activities, 21 percent from non-farm activities, 28 percent from wages and 15 percent from others sources.

The paper thirdly examines the variability of income over time. It explains that the wide variety in income received during the year arises from the heterogeneity in income sources.

Due to the heterogeneity in income levels, sources and patterns, the policy implication suggested by this paper is that there should be a comprehensive set instead of a single easy way to improve the income and welfare of rural Thai households, the details of which are dealt with in other papers.

No. 15 Thanwa Jitsanguan, "Effect Off-Farm Employment on the Structure and The Distribution of Income", August, 1982.

This paper discusses in detail the effect of off-farm employment on the income structure and distribution in the four provinces namely Khon Kaen, Roi Et, Chiang Mai and Suphan Buri.

The paper points out from data of the four sampled provinces that other than farm income, off-farm and non-farm income contribute a considerable portion of income. These two sources of income serve to stabilize current income of farmers when the expected farm income is lacking.

Regarding the distribution of income, the paper indicates changes in income distribution among various income classes when farm, non-farm and off-farm incomes are taken cumulatively into consideration. The changes result in an improved situation for farmers in every province especially the low income farmer groups.

The paper also measures the change of income and of farm household distributions by using the Gini Coefficient technique. The result shows that when non-farm and off-farm incomes are taken into account with total income, the average Gini Coefficient is gradually decreasing. This implies that the off-farm employment helps to diminish the extent of income inequality.

The factors influencing income of farm household resulting in the difference of income distribution are also identified. The important factors considered in the paper are total man-days, current value of fixed capital, age and education of household head, number of household member, credit for production, expenditure on fertilizer and insecticide and the status of land ownership or land tenant. The multiple regression analysis is applied with these factors incorporated in the model. Results of multiple regression show that education of household head, number of household member, value of fixed capital and farm size are significant for some provinces only while man-days and credit are significant for every area. The rest of the factors are relatively non-significant in every area. The regression results are then used as a guideline in recommending policies which will help to create and develop the off-farm and non-farm activities.

The paper recommends to: promote labor intensive; low capital investment; and operation which using simple or intermediate level of flexible technology. The formulation of policy should concentrate on the off-farm activities that possibly take place after the crop season and such activities should be made short enough to allow farmers to sell their products for current expenses. Moreover, special credit programs as well as training courses should be set up to encourage the household industries and marketing information on products should also be provided to the farmers.

No. 16 Yongyuth Chalamwong, "Rural Household Labor Supply for Off-farm Work in Thailand", August, 1982.

This paper investigates factors affecting the farmer's decision to work in the off-farm labor market. Regression models are used to determine the effects of various factors on off-farm labor supply. These factors are own off-farm wage rates for both male and female, farm earnings, non-farm earnings, farm characteristics (farm size, modern farm tools and equipment and the multiple cropping index) and the household environment (number of adults, education and number of dependents aged 7-11 years old). Many functional forms are tried and a logarithmic functional form gives better estimates and a better goodness of fit. The results of the stepwise regression models representing farm operators (males) in the family show that own off-farm wage rate, spouse's off-farm wage rate, unearned income and multiple cropping index have positive sign while farm and non-farm earnings, farm size and asset have negative sign. The magnitude of the elasticities of these variables are 0.47, 0.14, 0.24, 0.16, 0.14, 0.14, 0.28 and 0.09 respectively. The results of another stepwise regression models representing the operator's spouse (females) indicates that the statistically significant variables are own off-farm wage rate (+0.57), farm earnings (-0.18), unearned income (+0.15), farm size (-0.25), multiple cropping index (+0.08), number of adults (+0.36), education (-0.51), and number of dependents aged 7-11 years (-0.61). In general, the results show that the set of explanatory variables support the hypotheses in explaining the variation in operator's off-farm labor supply.

No. 17 Richard L. Meyer and Adelaida P. Alicibusan, "Farm Household Heterogeneity and Financial Needs", August, 1982.

The paper describes the heterogeneity of financial needs of farm households in low income countries, and its implications for rural financial intermediation. The heterogeneity of the farm house-

holds for financial needs exists because of differences in enterprise combination, production and marketing techniques, family lifecycle, investment opportunities, management efficiency, consumption preferences and a variety of other factors. Cash flow of the Thai farm households are analyzed from weekly data collection to illustrate the heterogeneity that exists among farm households. The studies of other countries on cash flow namely the Philippines and Nigeria are also presented to show that the heterogeneity of farm households regarding their financial needs are similar.

In order to serve the needs and interests of farm households which are complex, the paper suggests the policy makers to design flexible, multiple-purpose financial intermediaries. These institutions should be one-step centers in offering both borrowing and savings services; available of loans on production, consumption, investment and non-farm activities; and flexible on borrowing and repayment times, loan procedures and interest on loans and savings deposits. Moreover, the paper suggests the government to develop a well designed savings strategy for the rural area.

No. 18 Vinai Artkongharn, "Profitability and Efficiency", January, 1983.

This paper estimates the rate of return per hour of labor for each major product output of each type of firm, profitability, returns to capital, and capital-labor ratios. The conclusion is that certain cement products, sweetened mango, pickled garlic, tables, desks, chairs, cupboards and ready-made garments are worthy of promotion.

No. 19 Pradit Charsombut, "The Silk Industry in Thailand", February, 1983.

This paper is an analysis of the silk industry in terms of patterns of employment, labor intensity in production, returns to labor and firm's income. Data in the analyses are collected mainly from the survey of establishments of silk weaving plants and households at the districts of Chonnabot and Ban Phai in Khon Kaen province and Pak Thongchai in Nakornrajsima.

The paper estimates that about half a million of farm households are engaged in the silk industry with the annual production of 700 tons for native silk yarns, about 16 tons for thrown silk yarns; and about 3.5-4.5 million square meters of silk fabric are annually produced. Most of the silk fabric production are non-patterned silk fabric.

Silk production is a labor intensive industry which generates employment for family labor, hired workers and subcontractors in villages. Production of high quality patterned silk fabric and heavy weight non patterned fabric yields attractive income to producers. Markets are not a problem for these types of products. The production expansion of the high quality pattern silk fabric and the heavy weight non-patterned fabric have good potential in increasing the incomes and employment of rural people. Promotion of the silk industry in rural areas will have advantages in terms of labor cost, land for workshops and availability of raw materials supplied.

Monograph

No. 1 Tongroj Onchan, Pradit Charsombut, and Yongyuth Chalamwong, "Rural Development Policy of Thailand – Relationship between Farm and Non-Farm Enterprises", September, 1982.

Conference Papers

No. 1 Yongyuth Chalamwong and Tongroj Onchan, "Land Characteristics and Tenure Arrangement in Selected Rural Areas in Thailand".

No. 2 Tongroj Onchan, "Lender Behavior in financing Rural Non-Farm Enterprises".

After reviewing key characteristics of formal lending institutions in rural Thailand, the paper highlights major problem areas. These include; the difficulty encountered by banks in implementing government lending directives, the poor record of abuses and arrears in farm credit schemes, the obstacles created by a low and inflexible interest rate ceiling, the effect of inadequate rural transport and communication infrastructure on the marketing and supervision of loans, the need for close monitoring relationship with clients, inadequacy of local bank staff, and dependence on main offices. The report concludes that banks are interested in mobilizing local savings and deposits, and that capital availability in local areas, per se, is not a problem. The banks are not, however, equipped to lend to small rural enterprises effectively. Local savings are therefore not used for local development, but are channelled back to Bangkok.

No. 3 Donald C. Mead, "Subcontracting in Rural Area of Thailand".

No. 4 Yongyuth Chalamwong, "A Descriptive Analysis of Wealth, Income and Credit in Rural Thailand"

The paper takes a financial appraisal approach to determine if farm households have the ability to repay debts through liquidation of assets. The work contains very useful information which can assist lending institutions in assessing the credit worthiness of lower income clients. The information includes distribution of current, intermediate and fixed assets; composition of household income from farm and non-farm sources; distribution of outstanding debts to institutional and non-institutional lenders; annual borrowing cycles; purposes of borrowing, etc. Although the paper draws few conclusions, the data it contains can be very helpful in the design of improved rural credit schemes, if and when such schemes are deemed necessary.

No. 5 James Boomgard, "Marketing of Rurally Produced Non-Agricultural Products: A Report on Village Visits"

No. 6 Vinai Artkongham, "Profitability and Efficiency".

No. 7 Tongroj Onchan, "The Ready-Made Garment Industry in Rural Thailand: A Research Report"

Demand is the crucial constraint to expansion of output and employment among sample firms. Other, less serious difficulties include product design, dyeing quality, shortage of unskilled labor during the wet season, scarcity of skilled labor and working capital finance. The firms are labor intensive, production is adapted to seasonal variations in labor supply, initial capital investment for entry is low, production skills are easily acquired, and output demand appears promising. For these reasons the government should consider the following potentially helpful interventions: provision of technical assistance, cultivation of certain types of co-operatives, expansion of formal credit facilities, and promotion of garment exports.

No. 8 Preeyanuch Apibunyopas, "Entrepreneurship and the Performance of Non-Farm Firms".

No. 9 Adelaida P. Alibusan and Yupadee Siriwan, "A Cash Flow Analysis of Farm Households in North and Northeast Thailand".

For each of model farms developed by the ROFEAP project, this paper provides an analysis of cash management practices adopted by sampled households. As in the previously-described paper, the content can be of great use in design of rural credit schemes. It also highlights the use of non-farm and off-farm cash income to finance farm enterprises, and is thus suggestive of alternatives to credit in increasing investment in farm activities. This analysis is being taken further by Adelaida Alibusan in a dissertation in preparation at Ohio State University.

No. 10 Saroj Aungsumalin, "Financial Structure and Perception Toward Constraints".

The paper examines the financial characteristics of firms producing bricks, cement products, pickled fruits and vegetables, furniture, ready-made garments, bean curds, noodles, silk cloth and wood carvings. It recommends that banks should provide more short and long-term credit and restrict overdraft accounts, that grace periods should be permitted for long-term loans, that the rate of interest not be subsidized, and that businesses be assisted in improving their record-keeping practices.

No. 11 Somsak Priebprom, "An Economic Analysis of the Irrigated Farm Household Model in Khon Kaen Province".

No. 12 Jeerakiat Apibunyopas, "An Economic Analysis of Employment in Kenaf, Cassava and Sugar Cane Production and Processing Northeast Thailand".

The purpose of this study is to use generalisations from the farm modelling exercises, described earlier, to assess the impact on regional employment and income of a new technology, air dry kenaf and of variations in the price of cassava and sugar cane. It concludes that at current prices air dry kenaf generates more employment than alternatives.

No. 13 Donald C. Mead, "Village Headman Questionnaire: Survey Results".

No. 14 James Boomgard, "An Assessment of Changwat Level Furniture Production in Three Provinces of Thailand".

While increases in rural incomes are likely to yield increasing demand for furniture, small producers in rural areas are unlikely to benefit if present trends continue. Bangkok manufacturers have a comparative production cost advantage related to their larger scale, greater capital intensity and proximity to material supplies (i.e. plywood and veneer). Smaller rural producers, if not forced out of the market, will tend to concentrate more on sales of Bangkok-made furniture. The decentralisation of government purchasing, however, may still serve to shelter small rural producers from this trend.

Policies and programs for this industry should serve the purpose of providing a supportive environment for rural producers. In this context actions in the area of raw material supplies might include: logging controls to assure a more stable wood supply, reduction of interregional price disparities for wood, decentralisation incentives for plywood and veneer plants, and wood pricing policy to encourage substitution (e.g. rattan, para-rubber wood, metal, plastic, etc.). With respect to this last, actions in the areas of training, materials procurement and investment credit may help reduce the costs of the transition from traditional to newer materials use.

Mr. James Boomgard at Michigan State University is completing a dissertation on the subject of changwat level furniture industry marketing, and additional insights and implications will be forthcoming from this work.

No. 15 Merle Menegay, "An Marketing Perspective for Village Farm Products a Basis for Discussion".

No. 16 Orasa Kiatying-Aungsulee, "Distribution of Farm, Non-Farm Enterprises in Farm Households".

No. 17 Pradit Charsombut, "The Silk Industry in Thailand".

This industry is very labor intensive and is characterized by high rates of self-employment and subcontracting arrangements which generate substantial returns to labor for higher quality products. At present domestic production is insufficient to meet demand, and the major constraint on domestic

production is a shortage in the supply of raw material. Other, less important problems include dyeing technology, pattern design, and labor shortages in the wet season. The policy and program actions which may be helpful in this context include; promotion of sericulture, improvement of skills in dyeing and design, promotion of export markets, promotion of subcontracting arrangements, promotion of filature factories, research and development on appropriate weaving machines, and modification of minimum wage and excise tax policy to maximize employment and income.

No. 18 Yongyuth Chalamwong, "An Analysis of Household Labor Supply for Off-Farm Enterprises".

No. 19 Sompong Orapin, "A Descriptive Analysis of Cotton Weaving Industry in Rural Areas in Thailand".

The industry is characterized by female labor intensity and seasonal variations in labor supply. Employment is maximized through subcontracting arrangements. Returns to labor range from B 8 to B 37 per day, and translate into family income generation of between B 300 and B 850 per month. Recommendations in regard to this industry include: encouragement of business and marketing leadership, improvement in rural roads, introduction of looms, skill development, formation of co-operatives and provision of credit.

No. 20 Vilailuck Thaiusa, "A Case Study on Bamboo Product Industry in Khon Kaen, Roi Et and Chiang Mai Provinces".

The market for bamboo products is at present relatively limited because the types and quality of current output is suitable only for local consumption. Expansion of employment and income in the industry will require government assistance in demonstration of new and improved product lines, training in skills required to engage in new production, introduction of small scale technologies, promotion of products to expand markets, and development of leadership and creative skills among producers. Actions to encourage bamboo planting to provide a sustained yield of material are also required. Although finance is not now a constraint on production, it would be a constraint on upgrading technology.

No. 21 Maythakul Kiatkrajai and Doosanee Songmuang, "Village Industry Studies Pottery Products Industry".

The current status of this industry is not promising. Returns to family labor are low and demand is limited for current product lines. Improvements would require identification of quality clay deposits, upgrading of types and quality of output, improvements in production technology, and creation of procurement/marketing co-operatives.

No. 22 Sumala Sirichoti, "Employment and Underemployment".

No. 23 Pichit Thani and Jamaree Pitackwong, "Informal Credit for Farm Household in Chiang Mai".

The purpose of this paper is to analyze current uses of credit to determine household preferences for credit sources and to assess the merits of formal credit expansion. It examines the extent and distribution of debt and the uses and terms of borrowing. It recommends that farmers be permitted to obtain group loans for non-farm enterprise purposes.

No. 24 Sungvean Chanthongkaew, "Hand Tools Industry in Roi Et and Chiang Mai".

No. 25 Nongluk Suphanchaimat, "Rainfed Farm Household Modelling in Khon Kaen".

No. 26 Rapeepun Jaisaard, "Results of Farm Household Modelling in Chiang Mai".

No. 27 Somchai Thepthana, "Firm Size and Productivity: A Case Study of Brick Industry".

Larger and more capital intensive firms are more productive and can produce a wider range of outputs than smaller firms. To improve the competitive position of smaller producers, actions in the areas of clay preparation, forming and drying of bricks, and firing and removal of bricks from kilns may be helpful.

No. 28 Rangsit Pooiripinyo and Pradit Charsombut, "Mat Production in the Northeast".

Production of mats generally provides low returns to labor, about B 6 per day, although higher quality output can generate up to B 50 per day. The low returns do not encourage cultivation or seeds, and the resulting shortage of raw material acts to maintain low productivity. Therefore seed production should be encouraged and high quality mat production should be promoted.

No. 29 Vinich Veerayangkul and Merle Menegay, "Soybean Curds Processing Industry".

Curd production is highly competitive and tied to local demand. Although returns to labor are relatively good (from B 5 to B 10 per hour), prospects for expansion of employment in the future are not encouraging.

No. 30 Vinich Veerayangkul, "Kuay Tiaw Industry".

No. 31 Amnaj Teeravanich, "Farm Modelling in Roi Et".

No. 32 Jacques Amyot, "Institutional Support of Small Industrial Enterprises Development in Thailand".

This paper identifies and briefly describes a proposed program for promotion of small scale and home industry in a regional development framework. The program stresses new product development, new enterprise development, entrepreneurship development and improved coordination between government agencies and private efforts at the regional level, and between the region and Bangkok.

No. 33 Merle Menegay, et al., "The Noodle Processing Industries in Selected Areas of North and Northeast Province".

Major problems in the industry are labor turnover, excess machine capacity and fluctuations in input (broken rice) prices. Current trends indicate a shift in production from hand to machine processing, and from smaller to larger producers. As a result smaller rural producers are switching from manufacture to marketing of noodles. Expansion of employment will thus depend on increases in the aggregate demand for output. The government might wish to explore the export potential of dried noodles in this regard.

No. 34 Plaek Sangsingkeo, "The Wood Carving Service Cooperative: A Case Study".

No. 35 James Boomgard and Merle Menegay, "Marketing Patterns for Manufacturing Firms in Rural Towns: Survey Results".

WORKING PAPERS

- No. 1 Merle Menegay and Vinich Veerayangkul, "Kenaf Processing in North-Eastern Thailand" August, 1980.
- No. 2 Tongroj Onchan, "The Textile Products Industry in Rural Thailand", August, 1980.
- No. 3 Pradit Charsombut, "The Silk Weaving Industry in North-Eastern Thailand", August, 1980.
- No. 4 Pradit Charsonbut, "Mat Making and Fish Net Making in North-Eastern Thailand", September, 1980.
- No. 5 Merle Menegay and Vinich Veerayangkul, "Agricultural Hand Tool, Animal Implement, and Machinery Manufacturers in Towns within Chiang Mai, Khon Kaen and Suphan Buri Provinces", September, 1980.
- No. 6 Saroj Aungsumalin, "The Brick Industry in Chiang Mai : A Preliminary Survey", September, 1980.
- No. 7 Somsak Priebprom, Rapeepun Jaisaard and Richard L. Meyer, "Farm Household Modelling : Objectives and Methodology", November, 1980.
- No. 8 Merle Menegay, Suwapote Lekawathana and Vinich Veerayangkul, "The Fruit and Vegetable Processing Industry in Selected Areas of Chiang Mai, Khon Kaen and Roi Et Provinces", November, 1980.
- No. 9 Richard L. Meyer, "Formal Credit Supplies for Rural Enterprises", November, 1980.
- No. 10 Donald C. Mead and Vinai Artkingharn, "Profitability and Efficiency : Some Preliminary Survey Results", November, 1980.
- No. 11 Jeerakiat Apibunyopas, "An Economic Analysis of Employment in Kenaf, Cassava and Sugar Cane Production and Processing in Northeast Thailand", November, 1980.
- No. 12 Yongyuth Chalamwong and Richard L. Meyer, "Wealth and Credit : A Descriptive Analysis of Farm Households Balance Sheet", November, 1980.
- No. 13 Saroj Aungsumalin, "Financial and Economic Analysis of Selected Small Scale Industries", November, 1980.
- No. 14 Rapeepun Jaisaard, "Preliminary Results of Farm and Household Modelling in Chiang Mai", November, 1980.
- No. 15 Somsak Priebprom, "Preliminary Results of a Rainfed Agriculture Model on Khon Kaen Province", November, 1980.
- No. 16 Tongroj Onchan, "The Ready-Made Garment Industry in Rural Thailand: An Overview". November, 1980.
- No. 17 Orasa Kiatying-Aungsulee and Richard L. Meyer, "Distribution of Farm and Non-Farm Enterprises in Farm Households", November, 1980.

- No. 18 Preeyanuch Apibunyopas, "Entrepreneurship : A Survey Result", November, 1980.
- No. 19 Vinich Veerayangkul and Merle Menegay, "The Kuay Tiaw Processing Industries in Selected Areas of Chiang Mai, Khon Kaen and Roi Et Province", November, 1980.
- No. 20 Vinich Veerayangkul and Merle Menegay, "The Soybean Curds Processing Industry in Selected Areas of Chiang Mai, Khon Kaen, and Roi Et Province", November, 1980.
- No. 21 Saroj Aungsumalin, "A Study of Cement Product Industry in Three Provinces of Thailand : A Preliminary Report", November, 1980.
- No. 22 Yongyuth Chalamwong, "Economic analysis of Labor Supply of Farm Families to Non-Farm Enterprises : A Preliminary View", November, 1980.
- No. 23 James Boomgard and Merle Menegay, "A Market Systems Approach to Research on Small-Scale Industries", November, 1980.
- No. 24 James Boomgard, "A Preliminary Assessment of the Furniture Subsector in Three Provinces of Thailand", November, 1980.
- No. 25 Somchai Thepthana, "The Brick Industry in Selected Provinces : A Preliminary Report". November, 1980.
- No. 26 Sumala Sirichoti and Richard L. Meyer, "Employment and Unemployment in Farm Household", November, 1980.
- No. 27 Arnanj Thiravanich, "Preliminary Results : Farm Household Model in Roi Et Province", November, 1980.
- No. 28 Pradit Charsombut, "Silk Weaving Industry : Preliminary Results", November, 1980.
- No. 29 Jacques Amyot, "Small Industrial Enterprise Supportive Institutions A Preliminary Assessment", January, 1981.
- No. 30 Jacques Amyot, "Northern Region Industrial Support Institute: Evaluation and Planning Perspectives", April, 1981.
- No. 31 Narongchai Akrasanee, "Government Policies, Rural Industrialization and Employment", June, 1981.

Present industrial policies and policy measures include investment promotion, protection and control, promotion of manufactured exports and promotion of industries in rural areas. The paper argues that these policies have been biased, in favour of Bangkok and the consequence of which has been a much lower growth rate in rural areas.

The paper proposes strategy for rural industrialization which has been classified into large scale labor intensive industries, large scale resource based industries and small scale and cottage industries. For the large scale industries, resource based as well as labor intensive, export promotion policy which include a wide range of incentives for export and correct the bias in favor of urban location would be necessary. However, availability of investment fund and location of industries should be taken into consideration as well. For small scale and cottage industries, to set up a special financial institution to provide credit together with commercial banks is recommended. Moreover, a credit guarantee scheme

and a rediscount scheme should also be organized. Apart from credit provided through financial institutions, several government agencies i.e. the Department of Industrial Promotion (DIP) should design a special program which can provide assistance in the areas of marketing, management and production technique for small scale industries.

No. 32 Saroj Aungsumalin, "Cement Product Industry in Three Provinces of Thailand", January, 1982.

Expansion of employment will depend on increase in demand for specific cement products. In this regard production of lamp poles has high potential in terms of government programs for rural electrification. Similarly, increases in demand for housing components and related infrastructure will serve to expand production of floor slabs, drainage pipes, cement blocks, etc.

No. 33 Yupadee Siriwan, "Cash Flow Analysis of Farm Households in Chiang Mai", June, 1982.

No. 34 Jame Boomgard, "The Woodcarving Industry in Northern Thailand : Summary of Research Findings", September, 1981.

This is a relatively high return industry with significant income and employment impacts. The major constraint is the availability of teak wood, and government policy with regard to management of teak reserves should be reconsidered in the light of potential and actual impact upon villager incomes. A tax on carved exports, for example, would be superior to the continued ineffectiveness of prohibitions on forest exploitation. Formation of wood carver co-operatives for procurement and marketing would also constitute a helpful step.

ANNEX D

SERVICES PROVIDED BY ROFEAP PROJECT RESEARCHERS

Services which are provided by the ROFEAP Project researchers and staff at the Center for Applied Economic Research, Kasetsart University are as follows:

- a) All the published papers which consist of research papers, conference papers, working papers and a monograph as listed in ANNEX C are on sales at the Center for Applied Economics Research, Faculty of Economics and Business Administration, Kasetsart University.
- b) All the data stored in various data files and set of magnetic tapes as mentioned in ANNEX A are available at the Center for Applied Economics Research, Kasetsart University.
- c) Handbook of procedures for using the ROFEAP data set which describes all the details of the project data is also available for reading at the Center, Kasetsart University.
- d) Documentation of all programs written by the Regional Administrative Management Center for this project can be obtained also from the Center. These programs are recorded in a magnetic tape. Lists of programs by ID number in table of contents are as follows:

LIST OF PROGRAMS

<i>PROG-ID</i>	<i>PURPOSE</i>
000 05	Reformats input questionnaires and correction input for updating village weekly master file.
000 06	Creates household member file containing info on each person in the village stock master file. Will be used along with weekly file to keep track of each person's work history.
000 07	Reads village weekly data file and creates listing containing number of each type of record belonging to a household. Creates some type of blank-filled file too.
000 10	Generates listing of all items from village stock (should be master file. "8"?)
000 09	Edits village stock wet season questionnaires S60, S61, S70.
000 13	Updates village household member status file and generates status report for each person for each week.
000 14	Creates village weekly household record from W20 and W30 to match against monthly file.

LIST OF PROGRAMS (continued)

<i>PROG-ID</i>	<i>PURPOSE</i>
000 11	Performs edit and consistency checks on village weekly master file and generates edit list for correction plus a tabulated report of errors by enumerator.
000 10 (the 2nd)	Performs edit and consistency checks on village stock master file and generates edit list for correction.
000 15	Performs edit and consistency checks on village monthly master file and generates edit list for correction, plus a tabulated report of errors by enumerator.
000 20	Edits town survey monthly questionnaire production and sales. (Minimal edit.)
000 22	Edits and updates town survey monthly master file.
000 24	Edits town stock entrepreneurship questionnaires. (Minimal edit.)
000 23	Reads town survey monthly master file and generates report request no. FEB004—labor supplementary variables: summed by month over all firms in each industry, then over all industries in a province, then over all provinces.
000 25	Prints town survey monthly questionnaires.
000 46	Creates village weekly cash flow variables, creating output file.
000 48	Creates village stock cash flow variables, creating output file (lot of unused code).
000 30	Creates supplemental variables for S10, S11, S20, S21, S30, S31, S40, S41, S42, S43, S44, S45, S46.
000 53	Prints farm modeling reports-request no. FEB001D, creates 5 output files M61, M20-1, M20-2, S10-1, S10-2.
000 51	Creates village monthly cash flow variables, creating output file.
000 50	Reads village weekly file and household member file, creating report file of an all items listing and frequency distribution. Variables V1-V7 from S10 (via the household member file) are printed in the right-most columns of the first table of data.
000 54	Reformats village weekly file and drops control and date record.
000 57	Reads village monthly file, M20 and M30 records, and assigns codes by enterprise. Generates output file, request no. FEB001 MOD.
000 56	Reads village monthly and weekly files, creating 2 files for cash flow reports.
000 58	Reads village monthly file, M20 records and creates price variable by province on 2 disc and 2 tape files.

LIST OF PROGRAMS (continued)

<i>PROG-ID</i>	<i>PURPOSE</i>
000 59	Reads village weekly file, W10, W11, W43 records and assigns codes by enterprise, creating file, request no. FEB003.
000 61	Reads village monthly, M30 records, and creates price variable by province and by product code, creating report file.
000 60	Reads village monthly data and generates a report listing all items, along with a frequency distribution list.
000 62	Computes and prints M20 price variables by product code.
000 64	Computes and prints M20 price variables by file number.
000 65	Computes and prints M30 price variables by file number.
000 70	Reads quarterly file of village weekly data, extracts record type 122 (W10) only, and accesses the household member file and creates labor report request number FEB001A.
000 66	Similar to program 000 50. Lists all items that were extracted by program 000 57.
000 67	Similar to program 000 60. Lists all items from program 000 59.
000 73	Reads monthly town survey file and prints report of cards 4-8, creates mag file and report file, request name MAR005.
000 71	Reads village monthly file and creates working file and report, request name FEB002.
000 72	Creates extracted file from quarter file of weekly village data type 122 only and generates labor report request FEB003. Uses household member file also.
000 74	Reads weekly village data file, creates extracted file of (W10) type 122 records and creates report MAR003. Uses household member file also.
000 76	Reads village stock data, selecting wet season questionnaire records S60, S61. Creates land variables for request no. MAR008.
000 75	Reads village monthly data, selecting M51, M52 records. Creates credit variables for request no. MAR004.
000 77	Reads (extract file 96-401 or) village weekly data, selecting W10, W11 records. Creates labor report for request no. MAR007. Uses household member file and 4 disc files.
000 95	Reads village weekly or monthly data file plus new week or month and merges them into a new file: 95-401.
000 96	Extracts merged files (weekly or monthly) based on 5 (weekly) or 6 (monthly) sets of record types placed on a parameter card. New file: 96-401.

LIST OF PROGRAMS (continued)

<i>PROG-ID</i>	<i>PURPOSE</i>
000 97	Reads village stock file and wet season file (records S70, S71, S72?) and creates random file of biodata for each person id.
000 99	Reformats master files containing blocking factor of 10 and record length of 120 into questionnaire format of blocking 12 and record length 100.
000 98	Reads village monthly file, selecting M20 records. Creates PRICE-A value file, containing PRICE-A for each B1 and B3 by dividing sum of B8 into sum of B9. File used by prog 000 78.
000 78	Reads extract file 96-401 merged weekly and monthly by month and generates income report by household as request MAR002.